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Analysing English Language Needs of Natural Science Students at the University of Burundi and the Burundi Higher Institute of Education

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UNIVERSITY OF BURUNDI DOCTORAL SCHOOL

Research Centre in Languages, Culture and Society (CRELACS)

Analysing English Language Needs of Natural Science Students at the University of Burundi and the Burundi Higher Institute of Education

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Dedication

To every researcher whose scientific work is dedicated to serve the community.

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Abstract

The present study set out (1) to identify the English language needs of natural science students at two main public higher education institutions in Burundi (namely the University of Burundi and the Burundi Higher Institute of Education), (2) to investigate the extent to which the needs of these students differ as perceived by different stakeholders and (3) to examine the extent to which the current English courses respond to the needs of these students. The study adopted a mixed-methods research design. The data were collected from students, teachers and policymakers by means of questionnaire, interview and analysis of existing documentation. The quantitative data were coded and processed using a statistical data analysis tool (IBM SPSS version 22). They were then analysed by means of descriptive and inferential statistics. The interview data were first coded and then analysed based on themes. They were analysed by means of a qualitative data analysis software (Weft QDA). The findings indicated that Natural Science students had a positive attitude towards learning English. Yet, they still had a moderate awareness of the global status of the English language. Besides, the findings revealed a number of reasons for which students learn/would learn English and the target situations as well. Furthermore, all the four language skills and strategies were perceived as important for students' studies and prospective work. The analysis of the findings also showed that the participants' perceptions of the needs differ to a small extent in terms of target situations, importance of the language skills and the general strategies for learning English. However, with regard to attitudes towards English and beliefs about language learning, the participants differ to a great extent. Regarding the awareness of the status of the English language worldwide and the reasons for learning English, the respondents differ to some extent. The findings also revealed that the current English courses taught in natural science departments do not respond to the needs of these students in many respects such as objectives, contents, time allocation, etc. Recommendations were therefore formulated for improving ELT in Natural Science departments

Keywords: Needs Analysis, Needs, ESP, Natural Science students

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List of Abbreviations and Acronyms

ANOVA: Analysis of Variance

BHE: Burundi Higher Education

BHIE: Burundi Higher Institute of Education

CPN: Communicative Needs Processor

EGP: English for General Purposes

ELT: English Language Teaching

ESP: English for Specific Purposes

LSA: Learning Situation Analysis

LSP: Languages for Specific Purposes

NA: Needs Analysis

PSA: Present Situation Analysis

QDA: Qualitative Data Analysis

SD: Standard Deviation

SPSS: Statistical Package for the Social Sciences

SST: Subject Specialist Teachers

TSA: Target Situation Analysis

UB: University of Burundi

TE: Technical English

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Chapter One: General Introduction

In this chapter, the researcher contextualizes the study. He also explains the problem under investigation and why it is worth researching. The chapter therefore starts with a reflection on the status of English language worldwide and the linguistic context in Burundi.

1. Background to the Study

1.1. The Dominance of English Language Worldwide

Today, English has become the most common language for day-to-day communication between people not sharing the same native tongue. According to Montgomery (2013), over 90% of international communication in every form throughout the world is done through the English medium. Crystal (2003, p. 189) comments that “there has never been a language so widely spread or spoken by so many people as English”. He refers to it as a “global language¹” and Marlina (2018) as a “global lingua franca”. It is true that French, Chinese, Spanish, German, Russian etc. achieved a significant international status. Yet, on the global stage, they are not largely used to the same degree as the English language. Indeed, by 2050, it is predicted that half the world population will be more or less proficient in English (The Economist, 2001; as cited in Johnson, 2009).

English is therefore found in most of (if not all) the walks of life. In the work of Graddol (1998, p. 8) entitled “The future of English” and published by the British Council, the following major international domains of English are listed:

- Working language of international organizations and conferences
- Scientific publication
- International banking, economic affairs and trade
- Advertising for global brand
- Audio-visual cultural products (e.g., film, TV, popular music)
- International tourism,

¹ According to Crystal (2003, p. 3), a language achieves a genuinely global status when it develops a special role that is recognized in every country.

- Tertiary education
- International safety
- International law
- A 'relay' language in interpretation and translation
- Technology transfer
- Internet communication

Graddol (2006) also stresses that English has joined the list of basic skills like knowing how to use a computer. He continues to argue that lacking the skill in English would be crippling.

Given the spread of the English language worldwide, its dominance as a universal language of science is now hardly disputed. As Lindsay (2011) emphasises, English has become the *de facto* language of science. Its hegemony in science over other languages is probably well seen in the number of works that are published in English. For example, drawing on Anglo- Saxon bibliographic databases, Ammon (2003, as cited in Ferguson, 2007), reports that by 1995, English accounted for 87.2% of journal publications in the Natural Sciences (e.g. Biology, Chemistry, Physics, Medicine and Mathematics) and 82.5% of publications in the social sciences (e.g. Sociology, Economics, etc.). After a period of more than 20 years that such statistics were produced, chances are that they have changed in an upward direction. In line with the above, Drubin and Kellogg (2012), discussing the opportunities and challenges of English as a universal language of science, argue that by learning a single language (English), scientists around the world gain access to the vast scientific literature and can communicate with other scientists anywhere in the world. Similarly, as Crystal (2012) states, English will put its users in touch with more people than any other language. It follows that global science relies on proficiency in English (Montgomery, 2013) and consequently, learning English is a deemed necessity for scientists whose first language is not English, (Nduwimana, 2018). Those opting to bypass it would, in most cases, find themselves more disadvantaged than their counterpart English speakers.

The overwhelming global dominance of the English language over other languages especially in key domains of science and research, technology, education, business, tourism etc., has had a great impact on the teaching and learning of that language. The English Language Teaching (ELT) has become a global activity and to a large extent, a business and industry (Dua, 1994;

Pennycook,1994, as cited in Agl-Issa, 2006). This is accounted for an increasing number of people wanting to learn English not for the sake of learning but because they feel the need (be it immediate or future) to use that language in specific domains. A branch of ELT that catered for the specific needs of learners is mainly English for Specific Purposes (ESP). At its beginning (in the 1960s), ESP was equated with EST (English for Science and Technology) since its early focus was directed to science and technology (Parkinson,2013). But today, the range of purposes and contexts in which English is used has extended and has made ESP an eclectic discipline (ibid.).

1.2. The Status of Languages in Burundi

Although the present study is concerned with the English language, it would probably be incomplete to describe the status of English in Burundi without considering the Burundi linguistic situation as a whole. The four main languages used in Burundi (Kirundi, French, Kiswahili and English) coexisted for decades without any explicitly defined language policy to regulate their uses. It was in 2014 that the government of Burundi adopted a law on the status of languages (see Law N° 1/31 of November 2014). The 2014 language policy confers on Kirundi the status of a national and official language and on French that of an official language. It is worth noting that even before 2014, Kirundi had been a *de jure* national and official language. It should also be mentioned that French was and still is occupying a privileged position in the public life of the country. It is still the dominant language used in administration and education, legislation, law, etc. For example, Mazunya (2011) argues that more than 80% of Burundi heritage is written in French. The declaration of French as an official language (in 2014) was in reality an “officialization” of a *de facto* status that the language had been enjoying well before.

As far as English and Kiswahili are concerned, the 2014 language policy promoted English to the status of official language and Kiswahili that of a language for regional communication. However, as Bigirimana (2017) noted, the reality on the ground is that English (outside school) is almost absent in the everyday life of Burundians. And for English to fully enjoy its status of official language, there is a need for the combined efforts of all Burundians (Bigirimana & Constantin, 2020). Similarly, although Kiswahili was initially (in the early 20th century) privileged by missionaries and colonial administration as a *lingua franca*, its use in the country is limited to few Burundians mainly living in provinces and towns bordering Tanzania to the east and the Democratic Republic of the Congo to the west. This limited use of Kiswahili is

partly attributed to the negative attitudes people displayed towards that language. Indeed, it was branded ‘a slang, the language of criminals, strangers, Muslims and uncivilized people’ (Belt, 2010, as cited in Nassenstein, 2019; Mazunya & Habonimana, 2010). The integration of Burundi into East African Community (EAC) which formally took place in July 2007, helped promote the two languages. For a full political and economic integration in the community, the two languages were introduced in primary school, since the School Year 2005-6.

1.3. The Teaching of English in Non-Linguistic Fields in Burundi Higher Education

In Burundi higher education, English is now taught in all fields of study. It is a compulsory course even in departments other than language ones. Usually, in non-linguistic departments, the English course is provided in the first and second years with a volume of 30h each year, adding up to a total of 60h at undergraduate level. In all non-linguistic departments, the course is taught as an additional subject (or *cours d'appui* in French). Although the researcher could not trace the history of the course back to many years, chances are that English has received little attention in non-linguistic departments.

Besides, contrary to what one might expect, the names (labels) allocated to the English course do not reflect the field of study of the students in most cases. This can be seen in the Table 1.1 depicting how the English course is titled in the field of Natural Science at the University of Burundi (UB) and the Burundi Higher Institute of Education (BHIE). In some classes, the course has generic or vague names like “English I”, “English II”. The table also shows the years in which the English course is taught and the time allocated to the course in each field of study.

Table1.1: Name of the English Course and its Volume in Natural Science Field of Study

Institution	Field of study	Name of the course and the time volume		
		1 st Year	2 nd Year	3 rd Year
UB	Maths	#English I (30 h)	#English II (30h)	***
	Biology	#English I (30 h)	#English II (30h)	***

Burundi Higher Education Institute of	Chemistry	#English I (30 h)	#English II (30h)	***
	Physics	#English I (30 h)	#English II (30h)	***
	Geology (Earth Science)	#English I (30 h)	#English II (30h)	***
	Maths	TE 1 (30h)	TE 2 (30h)	***
	Biology-Chemistry	TE 1(30h)	TE 2 (30h)	***
	Physics-Technology	#English I (30 h)	#English II (30h)	***
	Geography	#English I (30 h)	#English II	***

TE=Technical English, # the course has vague or generic name, *** the course is not taught in 3rd year

The above table shows that there is no harmonization of the English courses in terms of names. In most of the natural science fields, the English course is named English I or English II. The table also indicates that there is no English course in the third year.

As far as the design of the ESP courses is concerned, there is in the programs of each department a description of the English course which defines its objectives and contents. Though the programs of each department have to go through a validation process by the National Commission for Higher Education, the objectives and contents of the English courses are not derived from a systematic formal Needs Analysis. The absence of Needs Analysis in Burundi ESP context is probably explained by the fact that English courses are developed by non-ESP specialists (or at least by those who have a little or no understanding of ESP theory). In some extreme cases, the ESP courses are designed by science teachers without any collaboration with language teachers.

Another issue worth highlighting about the ESP courses in Burundi is that there are no fixed² in-house materials (especially in form of coursebooks) designed specifically for ESP students in the Burundi context and approved by the Ministry of Education or institutions. Students and teachers therefore rely on daily or weekly prepared handouts. With such daily or weekly prepared handouts, it is easy to lose coherence between individual classes and hence coherence within of the entire course. Another potential effect of having no fixed English coursebook is that what is taught to students (or what is given to them as notes or handouts) in the same field of study, say Biology, is likely to change from one teacher to another (if the teacher changes for example) or from one institution to another.

Finally, the ESP courses are taught intensively (30h taught within one or two weeks). It is worth reminding that for the majority of non- English major students, the 30h for the English course constitute almost the only opportunity for exposure to the language. This implies that if the course is covered within two weeks, students will have only two weeks of exposure to that language.

2.Statement of the Problem

As seen above, the worldwide dominance of the English language has resulted in an increasing number of people wanting to learn that language, not for the sake of learning, but because they feel the need (be it immediate or future) to use it in specific fields. The emergence of these specific learners has influenced considerably the English Language Teaching. It led to the practice of identifying language needs of particular groups of learners so as to design tailor-made courses. Such a practice is commonly known as Needs Analysis. Today, scholars acknowledge the importance of Needs Analysis in any ESL course design especially in English for Specific Purposes (ESP). Thus, there is practically no ESP courses without a Needs Analysis beforehand.

Despite the paramount importance of Needs Analysis in ESP, this practice is still uncommon the Burundi context. Indeed, in a study conducted by Nduwimana (2018) on the need for ESP in Burundi Higher Education, while the majority of tertiary English teachers reported to have already taught English in departments other than English, only a few of them admitted to have

² By fixed coursebook, it is meant an officially approved coursebook to be used in teaching English to students in a given domain (e.g. Biology students).

conducted a Needs Analysis. Even for the few, it is very likely that they conducted an intuitive superficial analysis. Put differently, the ESP courses in Burundi are, for the time being, based on designers' intuition or personal experience, as students are not consulted at any stage of the course development. The unfamiliarity with the practice of Needs Analysis in Burundi ESP context is also reflected in the scarcity of Needs Analysis studies (at least those already published). In fact, a search³ in an online collective catalogue of the University of Burundi libraries with "Needs Analysis" as a keyword shows that no study has yet investigated the English language needs of natural science students in the Burundi context.

Given that the practice of conducting a Needs Analysis is still uncommon in the Burundi ESP context in general and in natural science departments in particular, the current ESP courses can be questioned in terms of their suitability for the specific needs of the learners. Thus, the present study is intended to bridge the gap by analysing the English language needs of Natural Science students at the University of Burundi and the Burundi Higher Institute of Education. It will provide ESP teachers and policymakers with information needed to design tailor-made English courses.

3. Research Aim and Objectives

The major aim of this study is to improve the teaching of English in non-linguistic departments in Burundi Higher Education in general and Natural Science departments in particular. To achieve this aim, the following specific objectives were set:

1. To provide a comprehensive picture of the English language needs of Natural Science students at two main public higher education institutions in Burundi as viewed by different stakeholders.
2. To investigate the extent to which the needs of these students differ as perceived by different stakeholders.
3. To examine the extent to which the current ESP courses respond to the needs of these students.

³ A search as of 17th of June 2020 in the University of Burundi online catalogue, <http://catalogue.ub.edu.bi/>

4. Research questions

This study was guided by the following research questions:

1. What are the English language needs of Natural Science students at two main public higher education institutions in Burundi?
2. To what extent do the needs differ as perceived by students, teachers and policymakers?
3. To what extent do the current ESP courses taught in Natural Science departments respond to specific needs of these students?

5. Hypotheses

This study is based on two hypotheses which correspond respectively to the second and the third research question. It is worth mentioning that the first research question does not have a corresponding hypothesis since this question is of descriptive nature. The two hypotheses are formulated as follows.

1. There is no statistically significant difference among students, teachers and policymakers in their perception of the English language needs of natural science students.
2. There is a discrepancy between the current ESP courses taught in Natural Science departments in Burundi and the English language needs of natural science students as perceived by students themselves, teachers and policymakers.

6. Motivation for the Study

The present study was motivated by a combination of three factors. Firstly, as the researcher observed, there is, among non-ESP specialists, a widely held view that teaching English in non-linguistic departments is a matter of teaching just technical vocabulary items. This view is very simplistic as it ignores the important aspects of language learning/teaching and hence downplays the complexity of language communication.

Secondly, there is a popular intuitive judgement (at least in the Burundi context) that science students dislike languages in general and English in particular. Such a judgement is probably based on a lack of awareness that English is a *de facto* universal language of science. An

identification of what students need and want in English from students themselves may help challenge such an intuitive judgement.

The last factor is based on the researcher's experience as an English teacher at a higher education institution. He was once assigned to teach English to Engineering students in the Applied Science Department. However, because of the short time that was given to prepare the course, he could not conduct a formal needs analysis and then design a tailor-made course for these students. He therefore resorted to ready-made textbooks and opted to use Glendinning's and Glendinning's (1995) '*Oxford English for Electrical and Mechanical Engineering*' textbook that was available electronically. Although the textbook appeared to reflect students' field of study, it turned out to be difficult due to their low level of English. They were not as motivated as was initially expected and the 30 hours allocated to the course was a too short time to go deep into the textbook.

7. Significance of the Study

As said above, for the time being, ESP courses (courses in non-linguistic departments) in the Burundi context are designed without conducting any systematic formal Needs Analysis and thus without consulting students at any stage of the design. This is unhelpful in that, in ESP, all decisions as to content and method are based on learners' reasons (needs) for learning the courses (Hutchinson & Water, 1987). It follows that an identification and analysis of Natural Science students' needs will be of great importance in many respects:

Firstly, it will provide ESP course designers with necessary information to set clear goals for the course and guide them in the design of suitable contents. Responding to students' particular needs will increase their motivation to learn the language and cope with this fast-changing world wherein English has become a global language of science and technology.

Secondly, although the study was conducted in Natural Science departments, it is hoped that its results will have an effect on the practice of ESP in the Burundi context in general. Serving as an example, it is hoped that other scholars will be informed of an existing avenue (Needs Analysis, since this is still unexplored in the Burundi ESP context) in the search for how to respond to the specific language needs of learners.

Finally, as policymakers at different levels play a key role in education in general and language teaching in particular; the study will help them make informed decisions in terms of how ESP

courses can be organized and taught in non-linguistic departments. For example, it will help them decide on whether or not to increase the time, to teach the English course at all levels of undergraduate studies, to set a national coordination board for ESP courses in Burundi, etc.

8. Limitations of the Study

Like many other studies, the present one had a number of limitations. Firstly, since it was carried out on a relatively large scale [it included all Natural Science sub-fields], it relied on students' self-evaluation to measure their current level of knowledge hence their difficulties in different skills and strategies. The study would have rather used a proficiency test.

Secondly, although different stakeholders were involved in the analysis of students' English language needs, it did not include potential employers. This is because the students in the present study are likely to work in diverse sectors after they complete the course. Had the study been conducted on subjects who are already working or on students in a more specific and vocation-oriented field like tourism, banking, medicine, etc., the inclusion of employers would have been easier.

Finally, contrary to what the researcher had expected, many teachers proved unwilling to participate in the study especially in interview. Besides, the sample sizes were unbalanced, that is, 173 students, 31 teachers and 10 policymakers. Thus, to measure the difference in the perception of the needs, the researcher used non-parametric statistics which are not as robust as parametric ones.

9. Operational Definition of Key Terms

Since some terms may be unfamiliar to readers and since the meaning of certain terms can vary depending on the context or field of study, the following key terms need to be operationally defined to make it clear what they mean in the context of the present study.

- **ESP (English for Specific Purposes):** To define ESP, this study combines the views of Hutchinson and Waters (1987, p 19) and Anthony (2018, p.1). ESP is then defined as an approach to language teaching in which all decisions as to content and methodology are based on the learner's reason for learning. It targets the current/and or future academic or occupational needs, focuses on the necessary language, genre, and skills to address these needs.

- **Needs:** the present study takes the concept of “needs” in its multifaceted nature which goes beyond the linguistic dimension. It covers a broad range of meanings including learners’ reasons for learning, their attitudes, their language proficiencies, their teaching and learning preferences, and the situations in which they will use the language (Hyland, 2006).
- **Needs Analysis:** Drawing on the definitions provided by Brown (2016) and Richards and Schmidt (2002), the expression “Need Analysis” is used here to refer to a systematic collection and analysis of all information necessary for designing an effective course for a learner or a particular group of learners. Needs analysis makes use of both subjective and objective information (e.g. data from questionnaires, tests, interviews, observation, etc.)
- **Course:** In order to avoid confusion, the present study adopts Anthony’s (2018) definition of course. This scholar defines a course as “a set of integrated sessions focusing on a particular subject of study” (p.5). Put simply, it is a complete series of lessons or classes or lectures.
- **English course description:** in this study, course description refers to information about the English course as found in the programs of each department or section. Such information is initially prepared for accreditation purposes. It should not be confused with a syllabus, which is a document consisting essentially of a comprehensive list that specifies all the things that are to be taught in the course.
- **Subject specialist teacher (SST):** in the present study, an SST is a teacher of a course (courses) leading to a student’s specialization in a given field of study (Biology for example). The SST must have the knowledge of the discipline of the students.
- **Coursebook:** in this study, a coursebook is used interchangeably with a textbook to refer to a book that students and teachers use as the basis of a particular course.

10. Structure of the Thesis

This thesis is organized into six chapters. The first chapter provides the general background to the study. It contextualises the study and explains the problem under investigation. The second chapter is concerned with the review of related literature. Starting with the origins and

development of ESP, the chapter pays special attention to the concepts of “Needs” and “Needs Analysis”. It then considers previous studies conducted on Needs Analysis and hence addresses the contribution the presents study makes to existing literature.

As far as the third chapter is concerned, it deals with the methodological procedures that were adopted in the study. Departing from the philosophical underpinnings of the study, it then explains in detail the procedures for data collection and analysis. The fourth chapter is devoted to the presentation and analysis of the data collected from questionnaires, interviews and existing documentation. Chapter five discusses the results with reference to other studies. It is in this chapter that the results collected from different instruments were merged in order to seek answers to the research questions and support or refute the hypotheses that guided the study. The last chapter provides a summary and a general conclusion of the study and presents recommendations for improving the teaching and learning of ESP. It also makes suggestions for further research.

Chapter Two: Review of Related Literature

Introduction

This chapter is concerned with the review of the literature related to the present study. It consists of three sections. The first section deals with the concept of ESP by focusing on its origins and development. The second section is exclusively devoted to the concept of Needs Analysis in ESP; it departs from the origins of the term to different models adopted in analysing the needs. The last section of the chapter explores previous studies on Needs Analysis and therefore addresses the contribution the present study makes to existing literature.

Section 2.1. ESP Origins and Development

This section is intended to help the reader understand the concept of ESP. It therefore begins with an overview of the definitions of ESP. It then proceeds with the origins and the development of ESP. The section also deals with the classification of ESP and the relationship between ESP and EGP (English for General Purposes). It ends with a discussion on the issue of discipline-specific knowledge, that is, the issue of how much knowledge of the students' discipline is required of an ESP teacher.

1. Definitions of ESP

ESP is an acronym for English for Specific Purposes. Its definition is not straightforward. Therefore, there is no general agreement in the ESP community on what ESP exactly means (Anthony, 1997). Indeed, as Stevens (1980, p.109) argues, "a definition of ESP that is both simple and watertight is not easy to produce". The disagreement over what exactly ESP means can similarly be seen in the following statement made by Ewer (1981, as cited in Alfehaid, 2011, p. 2).

The terminology of ESP is now getting into such a confused and contradictory state that, in my experience, it is impossible to carry on a discussion about the subject with practitioners outside one's own work-group for more than a few minutes without misunderstandings arising from this source.

With this lack of agreement in mind, the following discussion tries to review some of the definitions of ESP that exist in the literature.

According to Basturkmen (2017), ESP is an umbrella term which is used to refer to the teaching of English for all specific purposes. What is particular with ESP is that it is intended to be of clear and particular usefulness to the learners whose actual needs have been the subject of a *thorough analysis* (Remache, 1992) [emphasis is added]. Similarly, Wette (2018, p. 2) states:

The term ESP is conventionally used to refer to the teaching of language items, skills, text types and competencies needed by learners for success in specialized occupational, academic, or sociocultural domains such as business, engineering, science and technology, medicine, academic study, community access, tourism, or other service roles. The interests of ESP are therefore *wide-ranging* and essentially *pragmatic* [emphasis is added]

The pragmatic aspect of ESP is also emphasised in the definition provided by Mackay & Mountford (1978, as cited in Remache, 1992). It reads as follows:

ESP does not represent any new body of dogma as such, but is essentially a *pragmatic* response to a developing situation in which the many reasons that learners have for learning English are made amenable to more systematic description so that relevant and more effective materials can be prepared for the teacher to use. (Mackay & Mountford, 1978, p. 1, as cited in Remache, 1992) [Emphasis is added].

Similarly, Wette's (2018) definition can be seen as a comprehensive version of the one proposed by Paltridge & Starfield (2013, p.2), who state that '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.' The particular domain may range from academic to professional or range from business to engineering and to medical and tourism.

From the above definitions, it is notable that the focus is put on the learners' needs or their reasons to take the course. Such an emphasis is seen in Hutchinson's and Waters' (1987) definition. For these scholars, ESP is an approach rather than a product. They state that:

ESP must be seen as an approach, not as a product. ESP is not a particular kind of language or methodology, nor does it consist of a particular type of teaching material. Understood properly, it is an approach to language learning, which is based on learner need. The foundation of all ESP is the

simple question: Why does this learner need to learn a foreign language?
(Hutchinson & Waters, 1987, p.19)

Therefore, in ESP, the language teaching and learning is not an end in itself. It is rather done in the service of other subjects or domains of life (Mackay, 1975, as cited in Remache, 1992). Indeed, ESP came into being as a response to the dilemma as to how to make the language serve the purpose of the learners (Mackay & Mountford, 1978, as cited in Remache, 1992)

Some scholars (e.g. Strevens 1988; Dudley-Evans & St John, 1998) have defined ESP by distinguishing between absolute and variable characteristics of ESP. The following are absolute and variable characteristics of ESP as put by Strevens (1988). For absolute characteristics, ESP consists of English language teaching which is:

- designed to meet specified needs of the learner;
- related in content (i.e. in its themes and topics) to particular disciplines, occupations and activities;
- centred on the language appropriate to those activities in syntax, lexis, discourse, semantics, etc., and analysis of the discourse;
- in contrast with General English.

For variable characteristics, Strevens contends that ESP may be, but is not necessarily:

- restricted to the language skills to be learned (e.g. reading only);
- not taught according to any pre-ordained methodology.

Dudley-Evans & John (1998) provide a rather more comprehensive definition of ESP. It has to be noted that their definition is a modified version of Stevens' (1988) that appeared, as it can be seen, a decade before. While Strevens, in his distinction between absolute and variable characteristics, argues that ESP is in contrast with General English (GE), Dudley-Evans and St John reject this statement as an absolute characteristic of ESP and have included more variable characteristics. For absolute characteristics of ESP, these authors argue that:

- (1) ESP is designed to meet specific needs of the learner;
- (2) ESP makes use of the underlying methodology and activities of the discipline it serves; and

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

Regarding variable characteristics of ESP, they are optional characteristics and hence are not necessarily characteristic of ESP. These are:

- 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 used for learners at secondary school level.
- ESP is generally designed for intermediate or advanced students; most ESP courses assume basic knowledge of the language system, but it can be used with beginners.

The above definition shows that, as Paltridge and Starfield (2012) comment, a key feature of an ESP course is that the content and aims of the course are based on the specific needs of the learners. Therefore, in ESP courses, the central focus is put on the language, skills, and genres appropriate to the specific activities the learners need to carry out in English. These activities range from academic to professional and to vocational. The definition also indicates that (though not necessarily) ESP students are much likely to be adult learners. They often constitute a homogeneous group in terms of learning goals, although not always in terms of language proficiency. It can also be seen that ESP is not necessarily intended for a specific discipline, nor is it necessarily targeted to a particular age group. In addition to all the above definitions, it has to be acknowledged that there exist many other scholars who attempted to define ESP and of whose definitions are not provided here.

Although all the above definitions differ in a way or another, they all agree that ESP is centred on learners' reasons for learning the language. To put it differently, it is the needs of the learners for taking the course that will determine what they would learn and how it would be taught. Thus, as a key feature of an ESP course, the content and aims of the course are oriented to the specific needs of the learners (Paltridge & Starfield, 2013). The central focus is therefore given to the language, skills, and genres appropriate to the specific activities the learners need to carry out in English.

ESP can then be regarded as a branch of a large field of Language for Specific Purposes (LSP). In LSP, the methodology, the content, the objectives, the materials, the teaching, and the assessment practices all stem from specific target language uses based on an identified set of specialized needs (Trace, Hudson & Brown, 2015). As examples of LSP, these authors mention Japanese for Business, Spanish for Doctors, Mandarin for Tourism, or English for Air-traffic Controllers. It has, however, to be noticed that it is ESP that paved the way for LSP. Indeed, in the literature on applied linguistics, LSP does not have an overly long and detailed history whereas much of the research has been done in the area of ESP instruction (Ibid).

Given that there are numerous definitions of ESP, it is worth being clear about what is meant by ESP in the context of this study. This study adopts Hutchinson's and Waters' (1998, p.19) definition according to which ESP is "an approach to language teaching in which all decisions as to content and methodology are based on the learner's reason for learning". It targets the current/and or future academic or occupational needs, focuses on the necessary language, genre, and skills to address these needs (Anthony, 2018, p.1).

2. Origins and Development of ESP

In the literature on ESP, there are papers which are mainly dedicated to the history of ESP (research) and/or the development of ESP (e.g. Alousque, 2016; Johns, 2013; Ramírez, 2015). This is, it is believed, because ESP has been and still is gaining much interest in ESL teaching for the last five decades. There is a general agreement among scholars that ESP began as a discipline on its own in the 1960s (e.g. Hutchinson & Waters, 1987; Dudley-Evans & John, 1998; Johns, 2013). This section discusses the factors that contributed to the emergence of ESP and those that accelerated its development.

2.1. Origins of ESP

According to Hutchinson & Waters (1987), there are three trends identified as the main reasons for the emergence (or the birth) of ESP. The first trend is *the demands of a brave new world*. These demands were felt at the end of the Second World War when the fields of technology and commerce developed dramatically. In order to cope with the dramatic development that was taking place, there was a need for an international language. The chances fell to English. Consequently,

the effect was to create a whole new mass of people wanting to learn English, not for the pleasure or prestige of knowing the language, but because English was the key to international currencies of technology and commerce. Previously, the reasons for learning English (or any other language) had not been well defined.

[...] as English became the accepted international language of technology and commerce, it created a new generation of learners who knew specially why they were learning a language – businessmen and –women who wanted to sell their products, mechanics who had to read instruction manuals, doctors who needed to keep up with developments in their field [...]. (Hutchinson & Waters 1987, p.6).

In addition to this development in science and technology, the oil crisis of the early 1970s speeded up the emergence of ESP. Oil-rich countries increased their economic power and they became field of interest for investors. Therefore, funds and western expertise started to flow into those countries.

The second trend occurred with the *revolution in linguistics*. This revolution consisted of the new studies in linguistics. As a result, more attention was shifted from the formal features of language – in contrast to what was traditionally done – to ways in which language is used in real communication.

The third trend came with the development in educational psychology as the *focus on the learner* was becoming something of concern. Learners' motivation and interests became central. It was therefore assumed that courses with clear relevance to the needs of the learners would improve learners' motivation and thereby make the learning better and faster.

Added to those three main reasons for the emergence of ESP identified by Hutchinson and Waters (1987), another factor was the increasing number of learners from non-English speaking backgrounds who were studying or working in English-speaking countries, such as UK, USA, Australia, etc. as part of aid projects in the developing world. (Dudley-Evans & John, 1998; Wette, 2018)

2.2. Development in ESP

Since its emergence in the 1960s, ESP has developed continually. It is notable, however, that ESP was not a monolithic universal phenomenon; it has developed at different speeds in different countries (Hutchinson & Waters, 1987). Its developments are now reflected in an increasing number of publications, conferences and journals dedicated to ESP discussions (Tratnik, 2008). Examples of ESP journals, as Johns (2013) listed, are *English for Specific Purposes* (ESPJ), *Asian ESP Journal*, *ESP World*. It should be noted that the development of ESP went through phases and was influenced by new insights yielded in other fields of study mainly theoretical and applied linguistics and ELT (Alousque, 2016; Dudley-Evans & John, 1998; Hutchinson & Waters, 1987). To put it differently, the way language was described (language descriptions) has had a great influence on the development of ESP.

At its beginning in early 1960s, ESP was identified with EST (English for Science and Technology), an area that was then much researched upon. Indeed, Swales (1985, as cited in García Mayo, 1998) uses the development of EST to illustrate the development of ESP in general. This is what he says:

EST is the senior branch of ESP — senior in age, larger in volume of publications and greater in number of practitioners employed. [...] With one or two exceptions, English for Science and Technology has always set and continues to set the trend in theoretical discussion, in ways of analysing language, and in the variety of actual teaching materials. (Swales, 1985, p. X, as cited in García Mayo, 1998)

At that time, the central focus of ESP research tended to be descriptive (Johns, 2013). To put it another way, ESP research was mainly concerned with statistical grammar counts within written discourses. This practice corresponds to what Hutchinson and Waters (1987) regard as the first phase of ESP development. It took place, they argue, mainly in the early 1960s and early 1970s. It is known as *register analysis*, that is, the concept of special language.

In the 1960s and the early 1970s; there was a principle according to which the language of Electrical Engineering forms a register different from, say, that of Biology. With this belief in mind, ESP scholars were mainly concerned with identifying the grammatical and lexical features of these registers. This can be noticed in Richards' (2001, p. 30) explanation according to which 'register analysis studies the language of fields such as journalism, medicine, or law

for distinctive patterns of occurrence of vocabulary, verb forms, noun phrases and tense usage'. ESP teaching materials and syllabuses were then based on the linguistic features of the registers. For example, Herbert (1965, as cited in García Mayo, 1998), believed that by putting emphasis on the typical forms of language found in written engineering texts, by highlighting the typical sentence patterns and by isolating certain aspects of vocabulary from the texts chosen for class discussion, the foreign students of engineering would be substantially aided in their specialist English.

Smoak (2003, p.23; as cited in Ramírez, 2015) explains that ESP instructors thought of their job as "to teach the technical vocabulary of a given field or profession". At that time (in the 1960s and the early 1970s), in addition to grammar counts, frequency studies were common. These studies were intended to provide an inventory of lexical items to be taught (Alousque, 2016). As Hutchinson and Waters (1987, p. 10) explain, the main motive behind register analysis was to make ESP courses more relevant to learners' needs. Thus, in producing syllabuses, high priority was given to language forms that learners would meet in their science studies.

Although, as an approach, register analysis pioneered developments in ESP, it proved to be weak and was therefore subject to strong criticism. The following is a synthesis of its weaknesses (Alfehaid, 2011; García Mayo, 1998; Hutchinson and Waters, 1987; Ramírez, 2015):

1. It was descriptive rather than explanatory. In other words, whereas it could give an account of distinctive patterns of occurrence of vocabulary, verb forms, noun phrases and tense usage, it could not give a guidance as to when one form is preferred to another, nor could it explain how any particular form fits into the structure of a text, that is, what precedes or follows it.
2. Register analysis was very much sentence-based and form-focused. To put it differently, it could not identify the linguistic structure of longer samples of written or spoken text. Besides, it showed an extreme concentration on form and offered little explanation about why and how the sentences were formed and combined as they were.
3. Providing lists of the special language of science, the pedagogic application of the results of register analysis studies has led to the teaching of what Widdowson (1979) refers to as 'usage' as opposed to 'use'. According to Widdowson, 'usage' is the exemplification of

linguistic rules, where language is seen as isolated grammatical items, while ‘use’ is the manner in which these rules are drawn upon to perform social acts or the ability to do so.

Given all these weaknesses, register analysis was taken over by what is commonly known as *rhetorical or discourse analysis*. Rhetorical or discourse analysis marked the second phase of ESP development. It was introduced in the 1970s. Contrary to register analysis which was much sentence- and form- based, discourse analysis shifted attention away from sentence level to level beyond sentence. As Robinson (1991, p.24, cited in Garcia Mayo, 1998) puts it, the main concern in discourse analysis was not so much on ‘the frequency of feature X or Y but the reason for the choice of X rather than Y in developing a text. The focus was thus on the sentence, and on the writer's purpose rather than on form’. Attention was shifted from sentence grammar to how sentences are combined to produce meaning in discourse. This can be noted in the basic hypothesis formulated by Allan and Widdowson (1974, as cited in Hutchinson & Waters, 1987, p. 10).

We take the view that the difficulties which students encounter arise not so much from a defective knowledge of the system of English, but from an unfamiliarity with English use, and that consequently their needs cannot be met by a course which simply provides further practice in the composition of sentences, but only by one which develops a knowledge of how sentences are used in the performance of different communicative acts’ (Allan and Widdowson , 1974, as cited in Hutchinson and Waters, 1987, p. 10).

As the development in ESP continued, a new stage was reached. It is known as *Target Situation Analysis* (TSA). Hutchinson and Waters (1987) explain that the aim of TSA was to establish procedures for relating language analysis more closely to learners’ reasons for learning the language. They define a target situation as a situation in which the learners will use the language they are learning. In designing ESP courses, designers should proceed first by identifying the target situations and then conducting a rigorous analysis of the linguistic features of that situation. The first scholar to have attempted to establish a detailed model for Needs Analysis is Munby (1978). Unfortunately, as Dudley-Evans & John (1998) explain, the nature of that model proved cumbersome and had therefore little direct influence on ESP. It however marked at that time a certain ‘coming of age’ of ESP (Dudley-Evans & John,1998; Hutchinson and Waters, 1987).

As register analysis, discourse analysis and TSA, which, according to Hutchinson and Waters (1987), looked at the surface forms or surface linguistic features of the target situation, a new approach was applied in ESP in order to bridge the gap of the three preceding. It is known as *skills and strategies* and is considered as the fourth stage of ESP development (ibid.). *Skills and strategies* approach attempted to look below the surface. It favoured not the language itself, but the thinking processes that underlie language use.

An example of a course based on skills and strategies approach is *Skills for learning* developed by the University of Malaya ESP project (Dudley-Evans & John, 1998). The course shifted the focus away from the teaching of language (grammar and vocabulary) to the teaching of the basic skills (Alousque, 2016).

The fifth stage in ESP development was reached with the *learning-centred approach* that was developed by Hutchinson and Waters, (1987). These authors raised critiques on the previous approaches. These approaches, they explain, were fundamentally flawed in that they were all based on descriptions of language use. The same authors state that it cannot be assumed that describing what people do with language will enable someone to learn it.

Contrary to language-centered (register analysis, discourse analysis) and skills-centered approaches; the learning-centered approach considers the learner at every stage of the course design process. Indeed, language-centered approaches determine the ESP course depending only on the nature of the target situation. A skills-centered approach goes beyond the target situation to determine what process enables the learners to perform in that target situation. The learning-centered approach, considers not only the competence that enable the learners to perform, but also how it is acquired. In other words, this approach looks far beyond to consider other learning factors, which are sometimes in total contradiction to the apparent needs of the target situation.

3. Branches of ESP

ESP is now a very large and expanding field. Different scholars have attempted to classify ESP (e.g. Anthony, 2018; Brown, 2016; Hutchinson and Waters, 1987, Jordan, 1997 ; Robinson, 1991; Dudley-Evans & John, 1998). Although there are different categorisations of ESP, there has been a general tradition to classify ESP into two major branches. These are English for Academic Purposes (EAP) and English for Occupational Purposes (EOP). The division of ESP into these two main types is based on whether the learners use (or will use) the language they

are learning for academic study or for work. In this respect, EAP, on the one hand, is defined as ‘the teaching of English with the specific aim of helping learners to study, conduct research or teach in that language’ (Flowerdew and Peacock, 2001a; as cited in Alfehaid, 2011). It follows that, as Alfehaid (2011) noted, the nature of EAP is often educational.

On the other hand, EOP ‘refers to English *that is not for academic purposes*; it includes professional purposes in administration, medicine, law and business, and vocational purposes for non-professionals in work or pre-work situations’ (Dudley-Evans and St John, 1998, p.7) [emphasis is added]. EOP is therefore often closely related to students’ work or profession. Thus, EOP courses often attempt to improve work-related language skills (Alfehaid, 2011).

Though the division of ESP into EAP and EOP seems to be straightforward, Hutchinson and Waters (1987) argue that the distinction between the two branches is sometimes not clear-cut. Indeed, one can work and study simultaneously. Besides, ‘it is also likely that in many cases the language learnt for immediate use in a study environment will be used later when the student takes up, or returns to a job’ (ibid, p 16). Similarly, Belcher (2006, p.134, as cited in Alfehaid, 2011) explains that ‘the goals of EAP and EOP are not always easily separable’. For instance, English for Economics may be for either academic or occupational purposes

It is notable that EAP and EOP can be divided into sub-branches. To get a full picture of further subdivision of ESP, it is worth referring to Dudley-Evans’ and St John’s (1998) representation of ESP (see Figure 2.1).

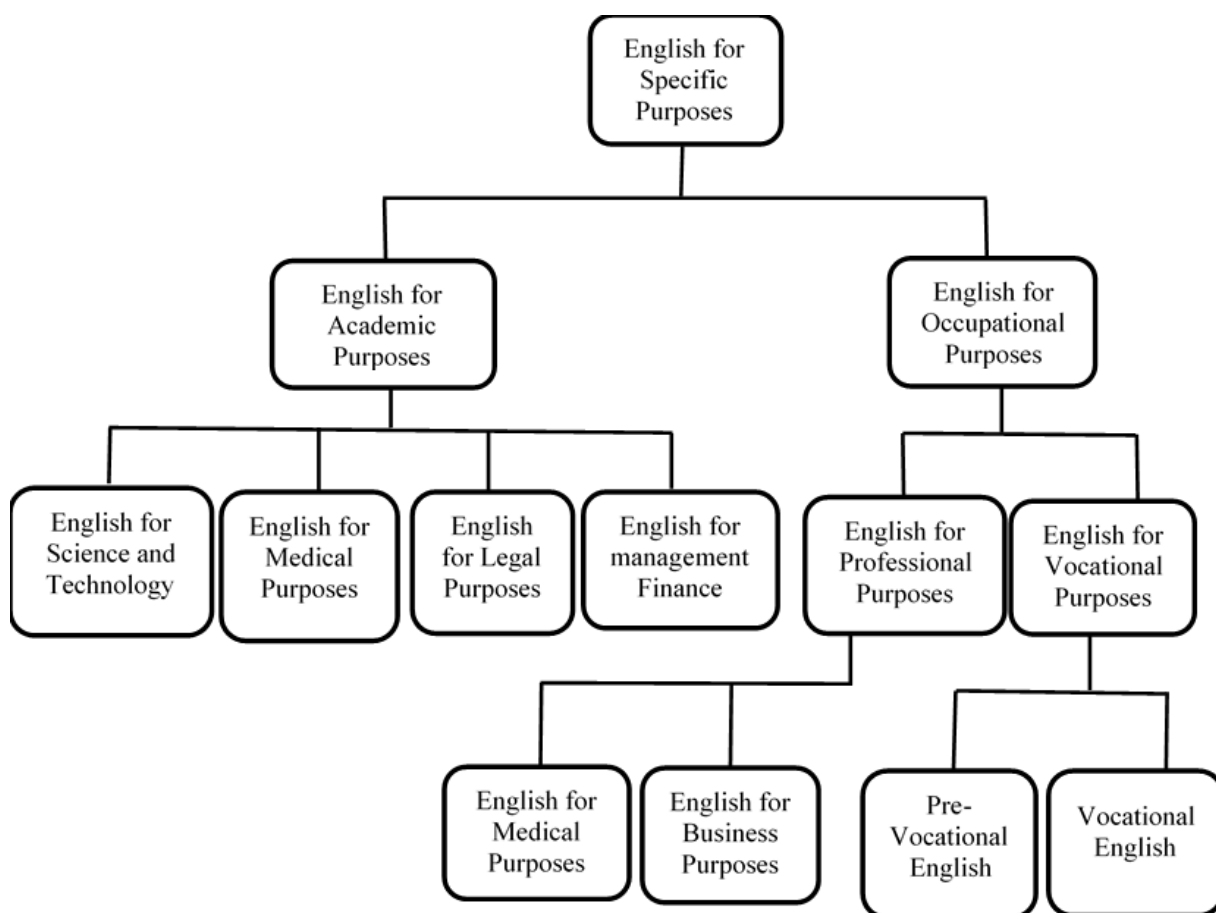


Figure 2.1: Branches of ESP as Adopted from Dudley-Evans and St John (1998)

The above figure shows that ESP is large and complex and therefore EAP and EOP can be divided into further subfields. Some of the common subfields are English for Science and Technology (EST), English for Medical Purposes, English for Business Purposes, etc. Parkinson (2013) argues that due to the wide range of purposes and contexts in which English is used, ESP has become an eclectic discipline. The eclecticism of the field of ESP is reflected in Anthony's (2018) categorisation. This scholar provides the subdivisions of ESP up to the fifth level.

4. Difference between ESP and EGP (English for General Purposes).

In discussing the difference between ESP and EGP, reference is made to the definitions and characteristics (or distinctive features) of ESP. Scholars such as Dudley-Evans and St John, (1998) and Stevens (1988) define ESP by distinguishing between absolute and variable characteristics of ESP. It seems important to remind the reader of the absolute characteristics for the purpose of this section. It is notable that the absolute characteristics are not changing

and therefore characterise all ESP contexts. These characteristics are (Dudley-Evans and St John, 1998):

- ESP is designed to meet specific needs of the learner;
- ESP makes use of the underlying methodology and activities of the discipline it serves; and
- ESP is centred on the language (grammar, lexis, register), skills, discourse and genres appropriate to these activities.

These characteristics reflect the nature of ESP and show how ESP is different from other forms of English. The first characteristic reads that ESP is designed to meet the specified needs of the learners. But it can be argued that all English language courses are aimed to meet some sort of needs. To respond to this argument, Hutchinson and Waters, (1987) advocate that ‘what distinguishes ESP from general English is not the existence of the need as such but rather an awareness of the need. In this respect, an ESP practitioner is almost a teacher of General English unless he/she understands and focuses upon the special needs of his/her students (Robinson, 1991, as cited in Islam, 2011).

Unlike ESP, the needs in EGP contexts (e.g. school context) are not readily specified (Far, 2008). Therefore, the aim of EGP is to improve overall English competence involving a range of basics of skills such as reading, writing, speaking, listening, vocabulary, grammar, pronunciation, etc. (Bilokcuoğlu, 2012). This means that there is no particular situation targeted in this kind of language learning. Rather, attention is put on applications in general situations (Al-Humaidi, 2011)

Apart from the above definition-based distinction between ESP and EGP, Widdowson (1983, as cited in Popescu, 2010) uses distinctive features of ESP and EGP to describe well the difference (or relation) between ESP and EGP, as indicated in Table 2.1.

Table 2.1: Features of ESP and EGP as Established by Widdowson (1983).

EGP	ESP
▪ The focus is often on education;	▪ The focus is on training;

▪ As the learners' future needs are impossible to predict, the course content is more difficult to select; ▪ Due to the above point, it is impossible for the content in the syllabus to have a high <i>surrender value</i>⁴.	▪ As English is intended to be used in specific vocational contexts, the selection of the appropriate content is easier; ▪ It is important for the content in the syllabus to have a high <i>surrender value</i>, most relevant to the vocational context; ▪ The aim may be to create a restricted English competence
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It is notable, however, that there are many other scholars who attempted to compare ESP with EGP (Al-Humaidi, 2011; Cigan & Kordić, 2013; Dudley-Evans and St John, 1998; Far, 2008 ; Hutchinson and Waters, 1987; Popescu, 2010; etc.). Table 2.2 is a synthesis of the different views on the difference between ESP and EGP adapted from different scholars.

Table 2.2: Synthesis on the Difference between ESP and EGP

Criteria considered	EGP	ESP
The learners (age, level, previous)	▪ The age of learners in EGP classes may vary from children to adults	▪ ESP learners are usually adult learners. Therefore, they learn the language in order to communicate a set of professional skills and to

⁴ 'Surrender value' is a term from insurance policies (see: Corder, 1973 in Willis 1990, p. 42). Basically, it is the cash value of a policy when it is cashed in. In teaching terms, this is the overall utility (value) of the English taught by the end of a specific course; the higher the surrender value the greater the utility (usefulness) of the English taught (as cited in Far, 2008).

knowledge in English)	▪ EGP is much likely to be taught at primary and secondary levels. ▪ EGP learners have little or basic knowledge of the language system. Therefore, they are [real]beginners or pre-intermediate	perform particular job-related functions. ▪ ESP is mainly taught at tertiary level (mainly to adults). ▪ ESP learners are assumed to have basic knowledge of general English.
Needs of the learners	▪ Not readily specified	▪ The needs of the ESP learners are specified through need analysis.
Aim of teaching the language	▪ EGP study the language for general, open-ended or unspecific objectives	▪ The aim of ESP instruction is to enable learners to communicate in work-related or academic settings.
Vocabulary	▪ EGP focuses on general vocabulary	▪ ESP puts an emphasis on words and expressions occurring in work situations.
Content and methodology	▪ As a general rule in EGP, all the four main language skills (reading, writing, listening and speaking) are treated equally. ▪ In EGP class, there is concentration on the teaching of grammar and language structures	▪ In ESP, it is needs analysis that determines what language skills are mostly needed by learners and the syllabus is designed accordingly. For example, a tourist guide would mainly need to develop spoken skill. On the other hand, a business reporter would mainly need to improve writing skills. ▪ In ESP, the focus is put on the context. To put it another way,

	which are taken in isolation.	English is not taught as a subject separate from learner's real world, needs or wishes.
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5. Discipline-Specific Knowledge as an Issue in ESP

The question of who would best teach ESP has been and still is controversial (Dudley-Evans, 1993; Lesiak-Bielawska, 2015; Sierocka, 2014, etc.). Should ESP be taught by a teacher of general English having no (or very limited) educational background knowledge of the discipline of ESP students (e.g. a general English teacher called upon to teach ESP to Biology students)? Or, should it be taught by a specialist in the discipline? These questions stem from this central question: 'How much of discipline-specific knowledge is required of an ESP teacher? This question is also raised by Starfield (2016, p.157, as cited in Basturkmen, 2017, p. 6.) who explains that 'given the breadth of areas covered by ESP instruction, it is reasonable to ask who can teach ESP and how much content knowledge ESP professionals need.'

Before proceeding, it is worth explaining what is meant by discipline-specific knowledge. Discipline-specific knowledge (also called subject-specific knowledge) is the ESP teacher's knowledge of the content of the discipline of the learners. Some scholars (e.g. McDonough 1984, Hutchinson & Waters 1987; as cited in Sierocka, 2014) believe that ESP teachers do not have to acquire specialist subject knowledge, they argue that a knowledge of the fundamental principles of the subject area is considered sufficient. However, these scholars recommend ESP teachers to take advantage of the learners' specialist knowledge and to ask for clarification of terminology and key concepts that the teacher does not know or /and understand.

Those who are supportive of an ELT teacher as an ESP teacher (e.g. Akermark, 1983; Hyland 2002,) argue that the task of ESP teachers is to teach language, not content pertaining to the students' field (as cited respectively in Esteban & Martos, 2002; and in Sierocka, 2014). Mohammed (2012, p 507) summarises this view as follows:

In all ESP courses, it is the language that must be taught and not the subject matter, and since language teaching is a kind of science and has its own specific knowledge and principles such as teaching methodology, language

testing, phonology, sentence and vocabulary structure, grammar, etc., therefore, every ELT teacher must be adequately aware of these basic principles. [...] Moreover, this group⁵ thinks that the subject specialists even with good mastery of English, as they are unaware of these fundamental principles of language teaching, often fail to teach the language well. Their job tends to be merely translation of the specialised technical terms and texts.

As Mohammed (2012) also explains, for other scholars, an ideal ESP teacher is the subject specialist with an adequate knowledge in language teaching. This view assumes that the subject specialist is much more familiar with the technical terms and the subject matter of the students' discipline of specialization. But it is not common to find a subject specialist (e.g. a biologist, an economist, a medical practitioner, a mathematician, a chemist, a civil engineer, etc.) who, at the same time, possesses adequate knowledge in language teaching. The opposite – the subject specialist without knowledge in language teaching – is probably more common. The danger, as Basturkmen (2017, p. 6) points out, is that 'a subject specialist may take features and forms of language for granted and not be aware of the challenges that learning specialist language can pose for the second language learner.' A subject specialist is much likely to focus on the content of the discipline rather than on the language used in the discipline.

Other scholars (e.g. Dudley-Evans and St John, 1998; suggest team teaching, that is, collaboration in the same classroom between a general English teacher with a content teacher (or subject specialist). In team teaching, teachers work together in the same classroom, sharing responsibilities of students' performance and implementing teaching activities together (Soltani, Shafaei, Branch & Mahshahr, 2013). The positive effects of team teaching in ESP are acknowledged by different scholars. For example, Hansen & Hammen (1980, cited in Ahmed, 2014) argue that team-working reduces the gap between science and language. Similarly, Huerta, Ibáñez and Kaulen (1986), and Schleppegrell (1991), explain that team-teaching is a way of resolving doubts about content (cited in *ibid.*). In line with this, the benefits of team teaching are stressed by Barron (1992) and Buckley (1998) as they are summarized in Sierocka (2014, p. 17). These authors emphasize that with team teaching:

- the teachers can find out what they do not know from the experts,

⁵ Those who are supportive of an ELT teacher as an ESP teacher

- interdisciplinary relations between ESP or any foreign language departments and subject units may be promoted which again may have tangible results such as joint projects and publications,
- subject teacher's language or even content subject syllabus may be modified to make it more understandable to students during lectures and seminars,
- students' awareness that there is a direct relationship between their subject, course, specialization and English may be fostered which again leads to more elaborate language skills and achieving more advanced levels of proficiency in language.

Although team teaching appears to be an ideal solution to the issue of discipline-specific knowledge in ESP, it is associated with the following problems (Barron, 1992; Buckley1998, as cite in Sierocka, 2014). First, there is a danger that ESP teachers may believe in all they hear from the subject specialists, who may also be wrong. Second, timetabling may prove difficult when two or more staff members need to be in the same classroom. Third, subject specialists and ESP teachers may represent two very different pedagogic methods which may result in conflicts and misunderstanding. Finally, due to its extensive costs, it is often difficult to persuade the authorities to introduce team teaching.

Section 2.2. The Concept of Needs Analysis in ESP

This section deals with the concept of Needs Analysis in ESP. It starts with considering how the term is defined by different scholars and then moves to the origin of the concept. Other components of this section are about how needs are classified, the purposes for conducting Needs Analysis in ESP and the different approaches (or models) to Neds Analysis.

2.2.1. Definition of Needs Analysis

As it is the case with most concepts in the social sciences and humanities, the concept of NA does not have a straightforward definition. This might be due to the multi-faceted feature the term 'needs' itself has. As Richards (2001, p.54) argues, the term "needs" is not straightforward as it may seem to be. It is both ambiguous and imprecise (Chambers, 1980, p. 26; as cited in Alfehaid, 2011, p. 55). Consequently, different scholars define NA differently. It is worth noting however, that the existing definitions of NA have much more in common than in their differences.

According to Richterich (1983), Needs Analysis is a process which includes accumulating information on individuals or groups of individuals who are supposedly expected to learn a language. What is unclear in this definition is the kind of information that will be accumulated or collected. Therefore, depending on their views on language, language learning and teaching, different people involved in the same project might come to different conclusions of what constitute the needs of the learners.

Brown (1995, as cited in Brown, 2009), drawing on a combination of the definitions of NA that existed then, attempted to provide a workable definition. The resulting definition reads as follows: NA is

the systematic collection and analysis of all subjective and objective information necessary to define and validate defensible curriculum purposes that satisfy the language learning requirements of students within the context of particular institutions that influence the learning and teaching situation.
(p.36)

Brown (2009) acknowledged himself that this definition is ponderous. He therefore simplified the definition by making it shorter. This is what he states:

I will simplify that definition here by breaking it into several pieces. *Needs analysis* (NA) is the systematic collection and analysis of all information necessary for defining a defensible curriculum. A *defensible curriculum* is one that satisfies the language learning and teaching requirements of the students and teachers within the context of particular institution(s) involved. [...] Naturally, the *information necessary* to achieve this defensible curriculum includes all subjective and objective information, and any other types of information that turn out to be appropriate in the particular NA.

Contrary to Richterich (1983), it can be seen that both subjective and objective information will be collected in NA and any information that turns out to be appropriate. What is common in Richterich 's (1983) definition of NA and Brown 's (2009) is that NA is a process rather than a product. In other words, it is systematic.

The feature of NA as being a process or being systematic is reflected in a number of definitions. Richards et al. (1992, as cited in Alfehaid, 2011) use the word process to define NA and provide more information as to different aspects the term NA covers. They define NA as:

the process of determining the needs for which a learner or group of learners requires a language and arranging the needs according to priorities. Needs assessment makes use of both subjective and objective information about the learner in order to know the objectives for which the language is needed, the situation in which the language will be used, with whom the language will be used, and the level of proficiency required. (p.242)

Witkin and Altschuld (1995) describe NA as a systematic process undertaken by the examiner for the sake of: (a) regulating priorities, (b) coming to a decision about curriculum or organizational improvement, and (c) allocating sources. Gupta (2007, as cited in Djebbari, 2016) affirms that NA is a process during which the course designers try to ascertain how to close a learning gap. NA includes determining the essential needs as an attempt to address them. It involves an analysis of different accumulated data, outlined as follows:

- Comparing between the current conditions and the desired ones
- Outlining the problems encountered by learners
- Comprehending different behaviours that contribute to the present conditions
- Verifying how the present conditions can be changed to manufacture the desired ones
- Developing solution approaches
- Building the necessary support for the solution approaches

Similarly, Richards (2001) refers to NA as ‘procedures used to collect information about learners’ needs. Although researchers may define NA differently, they all agree that it is the first step in ESP course design and regard it as a process-oriented or systematic collection of information that will help to meet the specific needs of learners. In the following section, attention is given to the term “needs” itself. The section will show how the term needs has been conceptualised differently by different scholars.

2.2.2. The Origin of Needs Analysis

The current term “Needs Analysis” appeared first as “analysis of needs” in India in 1920 (West, 1994). It was coined by Michael West to refer to what learners will be required to do with the foreign language in the target situation, and how learners might best master the target language during the period of training (ibid). Contrary to today’s trend in Needs Analysis (henceforth

NA), West was concerned with the needs of secondary school learners and consequently their needs could not be defined with any great precision. The concept was forgotten for about half a century after West introduced it. It was not until the 1970s that the term reappeared with the development of the field of ESP.

2.2.3. Typology of Needs in ESP

For readers about ESP in general and NA in particular, it is very likely that they will come across the following terms: necessities, wants, lacks, desires, preferences, requirements, goals, subjective, objective to name but few. These terms reflect the multifaceted nature of the term needs. To put it differently, the term needs covers a broad range of meanings in the ESP context.

2.2.3.1. Target Needs: Necessities, Lacks and Wants

Hutchinson and Waters (1987) use the terms ‘necessities’, ‘lacks’ and ‘wants’ to refer to what they call target needs, that is, what the learner needs to do in the target situation. Necessities can be defined as what the learner has to know in order to function effectively in the target situation. They are the type of needs determined by the demands of the target situation (West, 1994). For example, a non-English background student studying at an English medium university might need to know how to listen effectively to a lecturer, how to do an oral presentation, etc. Similarly, a medical practitioner might need to know the appropriate language for consultations, to know how to handle communication across cultural contexts, etc.

As for lacks, they are identified after analysing what the learner knows already; they are the gap between what a learner already knows and what he needs to know. Wants, on the other hand, refer to what the learner believes he/she lacks or needs. It is possible that what the sponsors, teachers and course designers regard as necessities clashes with what the learners want or think they lack. Learners’ wants must be considered in order to get their motivation.

2.2.3.2. Learning Needs

Learning needs is another type of need. As explained above, target needs refer to what a learner has to do in the target situation; they are the destination of an ESP course (Hutchinson & Waters, 1987). However, as these authors insist, ‘analysing what people do tells you little, if anything, about how they learnt to do it (ibid, p. 61). Put differently, in addition to identifying what a learner has to do in the target situation, an ESP course designer should determine how it will

be acquired. This difference between what has to be learnt and how it should be learned is reflected in the definition on Needs analysis provided by Dudley-Evans and St John, (1998). They argue that NA is the process of establishing the “what” and the “how” of a course.

Learning needs therefore include the learners’ preferred learning strategies, their attitudes, their motivation or reasons to take the course, learning styles, learners’ expectation from the course etc. Learning needs also include the constraints of time, place and available resources. An understanding of the learning needs will help to meet the necessities of the target situation. Indeed, an ESP learning should not be viewed as a mechanical project to be imposed mechanically on the learners (Tahir, 2011). The learning should rather be an enjoyable, pleasing, manageable, generative, creative and productive activity. For example, a text might well reflect what learners need to do in the target situation, but because of lack of motivation on the part of the learners, the learning will prove difficult.

2.2.3.3. Objectives vs Subjective Needs

A number of scholars distinguish between objective and subjective needs (e.g. Brindley, 1989; Dudley-Evans & St John, 1998; Nunan, 1988). On the one hand, objective needs refer to factual information about learners, that is, their age, sex, nationality, marital status, education background, previous language courses, current proficiency level, language difficulties, use of language in real life, the length of time spent in the target culture and previous, current and intended occupation (Brindley, 1989; Nunan, 1988; Robinson, 1991). Similar, Dudley-Evans & St John (1998) view objective (or perceived) needs as derived by outsiders from facts, from what is known and can be verified. To put it simply, objective needs are gathered from objectively observable data (Brown, 1995, p. 36). Such a type of need does not require the attitudes and views of the learners to be considered (Nunan, 1988. p. 14)

On the other hand, subjective needs refer to information which are not objectively observable (Brown 1995). They are derived from insiders (that is learners) and correspond to the cognitive and affective factors (Dudley-Evans & St John, 1998). These factors include the learners’ wants, desires, expectations, personality, self-confidence or other psychological manifestation (Brindley, 1989, p. 69, as cited in Niemiec, 2016) They include “the preferred length and intensity of a course, the preferred learning arrangement (whether the learner wants to engage in classroom or non-classroom based instruction), the preferred methodology (which will

include the types of materials and activities preferred by the learner), learning styles” (Nunan, 1988, p. 42).

2.2.3.4. Goal-oriented and Process-Oriented Needs

Widdowson (1983) makes a distinction between two types of learner needs: goal-oriented needs and process-oriented needs. On the one hand, goal oriented-needs refer to what the learners need to do once they mastered the language. On the other hand, process-oriented needs refer to the means of learning and has to do with pedagogical objectives (Widdowson, 1983, as cited in Niemiec, 2016)

2.2.3.5. Concluding Remarks on the Categorisation of Needs

There exists, as Dudley-Evans & St John (1998) noted, a confusing plethora of terms referring the concept of “needs”. Although scholars conceptualise the terms needs using different terms, a close look at these terminologies reveals a remarkable overlap. For example, what Hutchinson and Waters (1987) refer to as necessities falls under Widdowson’s (1983) goal-oriented category of needs. Similarly, what is referred to as wants by Hutchinson and Waters falls into the category of subjective needs. And what they refer to as learning needs falls in Widdowson’s (1983) category of process-oriented needs.

It follows that, among linguists in the field of ESP, there is still a disagreement on the exact definition of “needs”. While commenting on this issue, West (1994, p.) explains that “the very concept of language needs has never been clearly defined and remains at best ambiguous”. Therefore, as Richards (2001, p 54) argues, what is identified as a need is dependent on judgement and reflects the interests and values of those making such a judgement. Richards continues to explain by citing Burnet (1998). He paraphrases as follows:

Teachers, learners, employers, parents, and other stakeholders [...] may thus all have different views as to what needs are. For example, in considering the needs of immigrants, representatives of the majority population may see the immigrants’ needs as achieving cultural and linguistic assimilation as quickly as possible and hence may want a need analysis to identify the language skills immigrants require in order to survive, and ultimately assimilate into the dominant culture. The immigrants themselves, however, may see their goal as concerned with communication for survival and independence, particularly

economic survival, but may have no wish to assimilate in the dominant culture.

Need analysis is therefore multi-faceted. It embraces, as Hyland (2006, p. 73) observed, many aspects, including learners' goals and backgrounds, their language proficiencies, their reasons for taking the course, their teaching and learning preferences, and the situations they will need to communicate in (as cited in Flowerdew, 2013, p. 325).

2.2.4. The Importance and Purpose of Needs Analysis in ESP

The importance of conducting NA in ESP course design is now widely acknowledged among scholars. (Basturkmen, 2010; Brown, 2016; Dudley-Evans & St John, 1998; Hutchinson & Waters, 1987; Johns, 1991; Rahman, 2015; Richards, 2001, etc.). According to Johns (1991), needs analysis is the first step in course design and it provides validity and relevancy for all subsequent course design activities. Nunan (1988) explains that information got through NA can serve the following purposes:

- Need analysis can set the goals of the course and guide the selection of contents.
- The gap between teacher's and learner's expectation can be minimized by using NA to modify the syllabus and methodology.
- The gap between the teachers' and learners' expected teaching and learning approach can be identified.

Similarly, Richards (2001) provide a number of reasons for which needs analysis is conducted. They are listed below:

- To find out what language skills a learner needs in order to perform well at the target situation
- To help determine if an existing course adequately addresses the needs and potential students
- To determine which students from a group are most in need of training in particular language skills
- To identify a change of direction that people in a reference group feel is important.
- To identify a gap between what students are able to do and what they need to be able to do

- To collect information about a particular problem learners are experiencing.

It is worth noticing that information gathered through needs analysis on a particular group of learners marks the distinction between ESP and EGP (English for General Purposes) instruction. Indeed, both teachers and learners will be aware of the need for the English course and this is very likely to increase their motivation.

Being the first step in any ESP course design, Needs Analysis is therefore considered as the cornerstone or backbone of ESP programme design (Brown, 2016; Basturkmen, 2010; Otilia, 2015; Rahman, 2015). For Brown (2016), ‘NA and ESP are inextricably intertwined’. As Hutchinson & Waters (1992, as cited in Otilia, 2015, p. 55) noted, “If we know why learners need English, the content of the language can be adjusted accordingly and the teaching process will focus on these needs.” It follows that NA is the first stage in ESP course development (Flowerdew, (2013). Consequently, there is practically no ESP courses without a Needs Analysis beforehand.

2.2.5. Approaches to Needs Analysis

Since the advent of ESP in the 1960s, there has been different approaches and models of analysing learner’s needs. It has to be noticed that formal analysis of learners’ needs appeared in the 1970s (Flowerdew, 2013). Indeed, previously, language teachers have frequently based their teaching on some kind of intuitive or informal analysis of students' needs (Tarone & Yule, 1989, p 21, as cited in West, 1994). At first, the scope of needs analysis was narrow; it was restricted to a purely linguistic view of the term need as special language or register. Today, the scope has broadened to include non-linguistic aspects such as learners’ attitudes, wants, preferences, learning strategies and styles, etc.

2.2.5.1. Target Situation Analysis (TAS)

To better understand this approach to NA, it is, perhaps, worth understanding first what is meant by “target situation”. Target situation is a situation in which learners will use the language they are learning (Hutchinson and Waters, 1987, p.12). The target situations may range from academic settings to workplaces and to social events.

It is widely acknowledged that Munby (1978) is the first scholar to have developed a model for analysing the target needs in his work ‘*Communicative Syllabus design*’. As (Hutchinson and

Waters, 1987, p.54) explain, Munby presents a highly detailed set of procedures for discovering target situation needs. These procedures are known as Communication Needs Processor (CNP). The CNP is based on a set of parameters (or components) about which a range of questions can be asked to identify the target language needs of any group of learners. The parameters specified by Munby (1987, as cited in Songhori, 2008, pp. 6-7) are:

- **Purposive domain:** this category establishes the type of ESP, and then the purpose for which the target language will be used at the end of the course.
- **Setting:** the physical setting specifying the spatial and temporal aspects of the situation where English will be used, and the psychological setting specifying the different environments in which English will be used.
- **Interaction:** identifies the learner's interlocutors and predicts relationships between them.
- **Instrumentality:** specifies the medium, i.e., whether the language to be used is written, spoken, or both; mode, i.e., whether the language to be used is in the form of monologue, dialogue or any other; and channel of communication, i.e., whether it is face to face, radio, or any other
- **Dialect:** dialects learners will have to understand or produce in terms of their spatial, temporal, or social aspect.
- **Communicative event:** states what the participants will have to do productively or receptively.
- **Communicative key:** the manner in which the participants will have to do the activities comprising an event, e.g. politely or impolitely.
- **Target level:** level of linguistic proficiency at the end of the ESP course which might be different for different skills.

Munby 's (1978) work turned out to be a watershed in the development of ESP. It gained a lot of attention as "the most comprehensive approach to Needs Analysis" (Dickinson, 1987, p.90, as cited in West, 1994, p.9) Indeed, as Hutchinson and Waters (1987, p.54) comment, "The machinery for identifying the needs of any group of learners had been provided: all the course designer had to do was to operate it."

Although Munby's model for NA was meant to be detailed and comprehensive, it had significant drawbacks. West (1994, pp. 9-10) provides a synthesis of the shortcomings of the Munby's (1978) CNP as were highlighted by different scholars. He categorises the critiques as follows:

- *Complexity.* Munby's attempt to be systematic and comprehensive inevitably made his instrument inflexible, complex and time consuming
- *Learner centredness.* Despite Munby's claim, his CNP is not learner-centred. The starting point may be the learner but the model collects data *about* the learner rather than *from* the learner.
- *Constraints.* Munby saw constraints⁶ as matters to be considered after the needs analysis procedure had been worked through. This leads to an inevitable 'compromise phase'. In fact, what is needed has to be balanced against what is feasible.
- *Language.* Munby established detailed procedures for describing the learner but failed to provide a procedure for converting the learner profile into a language syllabus

Given the pitfalls of Munby's model, scholars have tried to make the TSA less complex. For Hutchinson and Waters (1987), target needs include necessities, lacks and wants (see the above section 'target needs'. However, some scholars (e.g. Dudley-Evans & St John (1998) Richterich & Chancerel (1997) exclude lacks and wants in the TSA, and put them under what is known as present situation analysis (PSA). The following section is concerned with PSA.

2.2.5.2. Present Situation Analysis (PSA).

According to Dudley-Evans and St John (1998), PSA estimates strengths and weaknesses in language, skills and learning experiences. To put it another way, it is intended to investigate what the students are able to do at the beginning of their language course by looking into their strengths and weaknesses. In PSA, both objective and subjective information can be collected. Objective data includes, for example, information about age, proficiency, prior learning experience) and subjective includes (self-perceived needs, strengths, and weaknesses. Put

⁶ These constraints were classified (Munby, 1978, p.217, as cited in West, 1994) as socio-political (e.g. status of the target language), logistical (financial constraints, numbers of teachers available), administrative (time available), psycho-pedagogic (previous learning methods) and methodological (recommended methods and materials available)

broadly, PSA is concerned with the notions of “lacks” and “wants” as addressed by Hutchinson and Waters (1987).

It is worth noticing that a Needs Analysis that is meant to be comprehensive will combine both TSA and PSA. Indeed, as Robinson (1991, p.9, as cited in Flowerdew, 2013) observes, “one is likely to seek and find information relating to both the TSA and PSA simultaneously. Similarly, a combination of TSA and PSA will help to enhance the learning and to reach the desired goals for an ESP course effectively (Songhori, 2008).

2.2.5.3. Learning Situation Analysis (LSA)

Hutchinson and Waters (1987) argue that, in addition to identifying the target needs (the knowledge and abilities that learners will require in order to function effectively in the target situation), which they refer to as the “destination”, there is a need to think of the “route” that will lead to the destination. In other words, there should be a detailed account of the *learning needs*. For Dudley-Evans and St John (1998), learning needs refer to language learning information, that is, effective ways of learning the skills and language.

As a reminder for the reader (see section *learning needs* above), learning needs include the learners’ preferred learning strategies, their attitudes, their motivation or reasons to take the course, learning styles, learners’ expectations from the course etc. Hutchinson and Waters (1987, p. 62-63) propose a framework for analysing learning needs as the Table 2.3 below shows

Table 2.3: A Framework for Analysing Learning Needs

1. Why are the learners taking the course? ▪ Compulsory or optional; ▪ Apparent need or not; ▪ Are status, money, promotion involved? ▪ What do learners think they will achieve? ▪ What is their attitude towards the ESP course? Do they want to improve their English or do they	4. Who are the learners? ▪ Age/sex nationality; ▪ What do they know already about English? ▪ What subject knowledge do they have? ▪ What are their interests? ▪ What is their socio-cultural background?
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resent the time they have to spend on it?	▪ What teaching styles are they used to? ▪ What is their attitude to English or to the cultures of the English-speaking world?
2. How do the learners learn? ▪ What is their learning background? ▪ What is their concept of teaching and learning? ▪ What methodology will appeal to them? ▪ What sort of techniques are likely to bore/alienate them?	5. Where will the ESP course take place? ▪ Are the surroundings pleasant, dull, noisy, cold etc.?
3. What resources are available? ▪ Number and professional competence of teachers; ▪ Attitude of teachers to ESP; ▪ Teachers' knowledge of and attitude to the subject content; ▪ Materials; ▪ Aids; ▪ Opportunities for out-of-class activities.	6. When will the ESP course take place? ▪ Time of day; ▪ Every day/once a week; ▪ Full time/part time; ▪ Concurrent with need or pre-need.

To help readers understand in practical terms the difference between target situation analysis (TSA), present situation analysis (PSA) and learning situation analysis (LSA), Dudley-Evans and St John (1998) provided a number of statements in a form of task or exercise (see task 7a, p. 124). They ask the readers to classify the statements according to whether they fall under TSA, PSA, and LSA. The statements are presented in the table below with the answers⁷.

⁷ The answers to the task were checked in Dudley-Evans and St John (1998, p. 263) in the section “guidance for tasks”

Table 2.4. Statements Illustrating TSA, PSA, LSA

1	I need to see vocabulary written down (LSA- learning need)
2	I have occasional meetings with British colleagues (TSA-target needs)
3	I find it difficult to write persuasively (PSA-present need)
4	I pick things up by listening (LSA-learning need)
5	Students X need to read more widely (TSA-target need)
6	I like problem-solving (LSA-learning need)
7	I get my tenses mixed up (PSA-present need)
8	I hate group work (LSA-learning need)
9	I have to write reports (TSA-target need)
10	My problem is finding the right word (PSA-present need)

2.2.5.4. Means Analysis

Another approach adopted in needs analysis is known as means analysis. Means analysis resulted from the failure of Munby's model to take account of matters of logistics and pedagogies in needs analysis (West, 1994). According to Dudley-Evans and St John (1998, p 124), means analysis provides information about the environment in which the course will take place. These authors state that:

Means analysis is an acknowledgement that what works well in one situation may not work in another". [For example,] While hotel staff around the world may share some similar language needs, how they learn the language, the conditions in which they are learning and where and how they apply the language are not the same. So, the needs, and how they are prioritised, ordered and then met will be different. (Dudley-Evans & St John, 1998, p 124).
[Parenthesis is added]

In line with the above, Jordan (1997, p 27) argues that means analysis is an attempt to adapt language courses to local situations, that is, to accommodate them to constraints such as cultural attitudes, resources, materials, equipment, methods. The same author explains that means analysis involves a study of the local situation, i.e., the teachers, teaching methods, students, facilities, etc. This will allow sensitivity of the situation in any country and discourage the

imposition of what he refers to as ‘alien models’ (of teaching, methodology, learning, etc.). The purpose, he continues to explain, is to prevent alienation caused by imported teaching methods that may be culturally inappropriate.

2.2.4.5. A Comprehensive Approach to Needs Analysis

Today, it is generally accepted that no single approach (or model) to Needs analysis can yield all the necessary information that will help in designing an ESP course. For example, Brown (2016) argues for a combination of two or more viewpoints in order to capture the maximum number of facets for needs. He advises to consider all the viewpoints and combine and use them as they turn out to be useful and appropriate at different stages of the Needs Analysis process. Similarly, as Pleşca (2017) concludes, the different approaches to NA are not exclusive but rather complementary. Indeed, none of these approaches can be a reliable indicator of what is needed to improve. Only a combination of several approaches can provide a comprehensive picture of learners’ needs.

Dudley-Evans and St John (1998, p. 125) propose a comprehensive model for needs analysis that includes aspects from many approaches. Their model encompasses:

- A. professional information about the learners: The tasks and activities learners are/will be using English for – *target situation analysis* and *objective needs*.
- B. personal information about the learners: Factors which may affect the way they learn such as previous learning experiences, cultural information, reasons for attending the course and expectations of it, attitude to English – *wants, means* and *subjective needs*.
- C. English language information about the learners: what their current skills and language use are – *present situation analysis* – which allows us to assess (D).
- D. the learners’ lacks: the gap between (C) and (A) – *lacks*.
- E. language learning information: effective ways of learning the skills and language in (D) – *learning needs*.
- F. professional communication information about (A): knowledge of how language and skills are used in the target situation – *linguistic analysis, discourse analysis, genre analysis*.
- G. What is wanted from the course.

H. information about how the course will be run – *means analysis*.

Section 2.3. Case Studies on Needs Analysis

There exist several studies conducted on needs analysis. This section presents some of the empirical studies that were previously conducted in the ESP context. The findings of these studies will be compared to those of the present study in the discussion of the findings. These studies are presented in a chronological order of publication – from relatively old to relatively recent ones. This section ends with a concluding analytical note on these studies.

2.3.1. Case Studies

Linde López (1997) conducted a Needs Analysis study at the University of Granada in Spain. The participants were 300 students enrolled in the faculty of Pharmacy in first year. The students had to study a compulsory English course. To gather information on learners' needs, the study used a questionnaire that was written in Spanish to ensure comprehension on the part of students. The questionnaire was intended to collect information on learners' 'felt' needs about their actual learning needs and learning means, their future communicative needs in the target situation (as lecturers, researchers, laboratory workers, etc. in the pharmaceutical and health science fields) as well as their interests, aptitudes and attitudes towards English. As major findings of the study, students reported overwhelmingly that their first urgent need was to know how to read texts and articles adequately followed by listening to lectures adequately. The students regarded reading and listening skills as their priorities over speaking and writing skills.

Miyake and Tremarco (2005) carried out a Needs Analysis study in Japan. The participants were 132 first year undergraduate nursing students, 18 second year undergraduate nursing students, 6 post graduate students and 11 professional nurses. The data were collected by means of a questionnaire and interview. The interviews were all conducted in Japanese so as to eliminate any misunderstanding that might result from the use of EFL (English as a Foreign Language). As far as the major findings are concerned, it was found out that students wanted a 50/50 balance between technical English and social English. It is notable that in the context of Miyake's and Tremarco's (2005) study, "social English refers to a wide range of language items and functions likely to be used in interactions with speakers of the English language" (p.33). The results of the study also indicated that students felt the need for activities that would promote their use of communicative social English throughout a course focusing on speaking

and listening skills. They (students) suggested that technical English should be introduced incrementally and should be limited to basic technical vocabulary.

Akyel and Ozek (2010) undertook a language Needs Analysis research in Turkey. The study aimed at getting a better understanding of the academic language needs of university students at an English medium university, in Istanbul, Turkey. To collect data, the researchers employed a triangulation method: they used a combination of a questionnaire and a semi-structured interview. Questionnaires were administered to 2328 students in the 1st, 2nd, 3rd and 4th years of 6 different departments of the university, and to 125 lecturers who were randomly selected from different departments. The questionnaire investigated (1) students' 'evaluation of the importance of the four main language skills (reading, writing, speaking and listening) in relation to their academic studies, (2) the frequency of students' use of the learning tasks and activities during their academic studies and (3) the frequency of the difficulties that the students had in using learning strategies related to the four main language skills.

The findings of the study revealed that English reading and listening were the most important skills for students' academic achievement. Thus, students highlighted the importance of speaking and listening skills. The study also showed that students had difficulties in applying reading strategies such as going through a text quickly and selectively, finding important information and ideas, and going through a text quickly in order to get the general idea.

Chostelidou (2010) conducted a Needs Analysis study at Alexander Technological Educational Institute of Thessaloniki in Greece in a context wherein formal Needs Analysis procedures in ESP were still not practiced. The aim of the study was to identify the needs of a target group of learners and thus introduce a needs-based course design. Put in more detail, the study was intended to identify (1) the students' prospective professional needs, (2) their needs in terms of language skills and tasks, (3) their deficiencies concerning language skills, and (4) their preferences with respect to learning styles, methodology, and teacher roles. The participants were 395 students at the Department of Accountancy. Adopting a triangulation of sources and methods, the data were collected by means of a questionnaire and semi-structured interview. The findings of the study indicated that there was a need for an ESP course which would (1) cater for the learners' subject-specific and academic needs, (2) involve authentic, challenging ESP materials, (3) encourage productive learning in a relaxed atmosphere, and (4) focus on language skills development and cater for any deficiencies of the learners.

Rahman (2012) conducted a Needs Analysis study at Putra University in Malaysia. His Needs Analysis focussed on reading skills in academic settings. The participants in the study were 50 undergraduate Computer Science students who were in the final semester of their university studies. Combining three approaches to needs analysis (Target Situation Analysis, Present Situation Analysis and Learning Situation Analysis), the researcher used a survey questionnaire to gather the data. The analysis of the findings of the study indicated that most of the respondents recognize the necessity of reading skills for their academic purposes such as readings of textbooks/reference books, technical journal articles, research reports, magazines articles, etc. The same students highlighted the need to learn specific technical vocabulary so as to improve their reading. The three major difficulties encountered by the students are skimming, scanning and decoding meaning of the subject matters written in English.

Hossain (2013) carried out a Needs Analysis study in Bangladesh at Presidency University. The study was conducted on engineering students with the aim of improving their English writing and speaking proficiency and accordingly develop teacher content and pedagogical knowledge in teaching Business or Advanced English Communication. It therefore investigated (1) the problems that students face in English writing and speaking, (2) the teaching aids they require from their ESP instructors, (3) the type of materials they would like, and (4) the role that ESP instructors should play so as to cope with the students' demands. As far as research instrument is concerned, the data were gathered using mainly a questionnaire completed by interview that was conducted with a few chosen subjects. As far as major findings are concerned, the study revealed that students had problems to produce analytical, coherent and cohesive writing and often failed to create well-organized paragraphs. The respondents suggested that instructional materials be delivered not only face to face, but also using internet and multimedia presentations with sound system. Similarly, the course materials should be chosen from different sources such as textbooks, instruction equipment manuals, CDs, DVDs, videotapes, and other materials used in content courses or job-related materials such as work forms, charts and samples of relevant course assignments and student papers; as well as materials from websites (e.g. business letters, dialogues, instructions, telephone conversations, podcasts, etc.).

In china, Li (2014) conducted a Needs Analysis study on Business English undergraduate students. The study was conducted in a context where traditional teaching opinions were still influential and there was still limited knowledge of Needs Analysis theories. The study was an attempt to analyse the target needs and learning needs of Business English undergraduates with

a view to provide a basis for the design and implementation of course contents that would help to set the teaching objectives and teaching contents and therefore provide references for the Business English teaching.

Li' (2014) study used a questionnaire designed on the basis on Hutchinson & Waters' (1987) model (for needs analysis). The questionnaire was intended to elicit information on students' perception of their language needs and wants, their current language lacks, and learning environments. Regarding learning needs, the results showed that simulation and group discussion are the most preferred activities in the classroom. Although students did not want classes mainly taught using Chinese, they required explanations in Chinese of difficult parts of texts. The study also showed that the students were dissatisfied with the teaching materials used in their class because they were too theoretical, outdated, and dull and lacked interactive exercises.

Aliakbari and Boghayeri (2014) conducted a Needs Analysis study on ESP learners at Ilam University in Iran. It is notable that the study was conducted in a context of a country where EFL and ESP courses were offered at universities in all the academic disciplines, but where graduates still had difficulties to use the target language due to a mismatch between the learners' needs and what the syllabi offered them. The participants in the study were (a) 49 architecture students in their third or fourth year of study who had already passed the general English and ESP courses and (b) 72 graduates from different universities in Iran. The data were collected by means of a questionnaire. The results indicated that reading comprehension skill, followed by writing, speaking, and listening were respectively the important skills identified by the participants. Besides, the respondents reported dissatisfaction with the textbooks, the pertinence of topics, as well as the length of the courses, that is, the courses did not fully meet the students' needs. The study concluded with a suggestion to revise the current programmes in order to offer more effective ESP courses for architecture students in Iranian universities.

Mihalache (2015) conducted a Needs Analysis study at the University of Agricultural Sciences and Veterinary Medicine of Iasi, in Romania. It is notable that Romania is part of the francophone countries, where French has a privileged status, especially in primary and secondary education. The participants in the study were (32) undergraduates (from 1st to 4th year) and were all attending English courses. To collect data, the study used a 20-item questionnaire that gathered both quantitative and qualitative information. The questionnaire combined both goal-oriented and process-oriented analyses. As major findings of the study, the

students (1) preferred conversation method and were interested in improving their English through documentaries and videos, (2) had difficulties to express themselves, (3) were motivated by getting a job in domains where the specialized language is important, (4) preferred texts that are related to their field of study, and (5) reported that the time allocated to English (1 hour per week) was not sufficient.

Talib, Mestari and Danial (2018) undertook a needs analysis study at the State University of Gorontalo, in Indonesia. The participants in the study were 50 students of Communication Science. Adopting a needs analysis model proposed by Hutchinson and Waters (1987), the study employed a triangulation of three instruments: a questionnaire, interview and document analysis. The findings indicated that students had problems with listening skill due to their limited vocabulary. Moreover, the speaking skill was reported as the most necessary skill for students. As far as learning needs are concerned, most students preferred to do activities in small groups and to have direct correction from their teachers.

Hattani (2019) conducted a Needs Analysis research at a Moroccan University. The study investigated student's attitudes towards learning English, language skills they consider as needed, the language skills and sub-skills in which students have difficulties. The participants were Moroccan university students doing the renewable energy engineering programme at the Higher School of Technology. The study used a quantitative survey, hence the use of a questionnaire that was administered to 30 students. The results demonstrated that respondents in the study have positive attitudes towards English language learning in general and ESP in particular. Therefore, they reported to have a significant level of motivation and interest in learning English. Regarding difficulties, most of the respondents face serious difficulties with the productive skills such as giving a speech in front of an audience, speaking to native speakers, pronunciation, and writing technical reports. The same respondents expressed more interest in speaking activities, reading, and vocabulary, compared to writing, listening, and grammar.

2.3.2. Analytical Note on the Needs Analysis Case Studies

The Needs Analysis studies presented in this section were conducted at tertiary level, which is the case with the present study. They were however conducted in different countries (China, Japan, Romania, Morocco, Spain, etc.), hence in different linguistic contexts. Besides, although some of these studies yielded similar results (e.g.: preference for reading and listening skills, difficulties in speaking), they were conducted in different disciplines such as Pharmacy,

Nursing, Accountancy, Engineering, etc. These disciplines are mainly profession-oriented. It follows that few Needs Analysis studies (if any) were conducted in Natural Sciences (Maths, Physics, Biology, Chemistry, Geology), the fundamental sciences which are more research-oriented. In the context of Burundi, the issue is even more serious; since the practice of language Needs Analysis is still uncommon.

The present study, therefore, contributes to the existing literature by analysing the English language needs of Natural Science students in the Burundi context. What is more, it is conducted in the context wherein French enjoys a privileged status as it is the language mainly used in official matters of the country.

Conclusion

This chapter was intended to help the reader understand the concept of ESP by reviewing the related literature. Section one attempted to show how different scholars define ESP and how ESP as a discipline on its own emerged and developed. The discussion concluded that though there exist several definitions, they all agree that ESP is centered on learners' reasons for learning the language. Regarding its origins, ESP emerged in the 1960S as a result of a combination of three main factors: (1) the demands of a brave new world, (2) a revolution in linguistics, and (3) the focus on the learners. It then developed through different phases: from register analysis to discourse analysis, and to a learning-centered approach.

Section two was centered on the notion of Needs Analysis which is now regarded as the cornerstone of any ESP course design. The discussion concluded that several terms are used to refer to 'needs' due to its multifaceted nature. Therefore, analysing learner's needs is not only a matter of the formal⁸ linguistic features of the target situation; any needs analyst must go far beyond the language and analyse other aspects leading to an effective teaching/ learning of the language. Section two also dealt with the different approaches to conducting Needs Analysis. These approaches range from target situation analysis to means analysis. The conclusion is that there is no single approach that can yield all the necessary information for designing an ESP. For this reason, it is advisable to combine two or more approaches. The last section presented case studies on Needs Analysis and addressed the contribution of the present study to existing literature on ESP. The following chapter is devoted to the methodology of the study

⁸ Related to the form rather than content

Chapter Three: Methodology of the Study

Introduction

This chapter is concerned with the methodology of the present study. It will therefore describe in detail the methodological procedures that were adopted. In order to provide the philosophical underpinnings of this study, the chapter starts with a discussion on research paradigms (or worldviews). These paradigms are considered because they guide the researcher in the choice of procedures for data collection and analysis. Other elements that are presented in this chapter are the research design, the participants and the sampling techniques. It ends with a brief note on ethical considerations.

3.1. Research Paradigms

Any scientific research is based on a number of philosophical assumptions or beliefs, be they implicit or explicit. These philosophical assumptions are often referred to as paradigms or worldviews (Creswell & Creswell, 2018). The term paradigm is used in research to mean “a set of fundamental assumptions and beliefs as to how the world is perceived which then serves as a thinking framework that guides the behaviour of the researcher” (Jonker and Pennink, 2010, as cited in Wahyuni, 2012, p. 69). In most cases, these assumptions remain largely hidden in research (Creswell & Creswell, 2018; Wayne, 2012), but they affect the researcher as they guide the choice of procedure for data collection and analysis. To better understand the concept of paradigm, it is worth understanding its major components which, as Lincoln and Guba (1985) explain, are namely, ontology, epistemology, methodology and axiology. These components are linked in that ontological assumptions give rise to epistemological assumptions; these, in turn, give rise to methodological considerations, which, in turn, give rise to issues of instrumentation and data collection (Hughes, 1995, p. 21, as cited in Cohen, Manion, & Morrison, 2017, p 5).

3.1.1. Major Components of a Paradigm

3.1.1.1. Ontology

Ontology is concerned with the assumptions we make in order to believe that something makes sense or is real (Kivunja & Kuyini, 2017, p 27). To put it another way, ontological assumptions are concerned with what constitutes reality (Crotty, 1998, p. 10, as cited in Scotland, 2012).

These assumptions are important because they guide the researcher in orienting his thinking about a research problem. In fact, ontology raises in the researcher's mind such questions (Kivunja & Kuyini, 2017, p. 27): "Is reality out there in the social world or is it a construction, created by one's own mind?", "What is the nature of reality?" Or, "Is reality of an objective nature, or the result of individual cognition?", "What is the nature of the situation being studied?" The position that a researcher takes on these questions will then underpin the way he approaches the research problem and answers the research questions.

3.1.1.2 Epistemology

Epistemology is another component of a paradigm. According to Greco (1999), epistemology is driven by two main questions: "What is knowledge" and "What can we know?" The same author continues to argue that if we think we can know something, this leads to a third question: "How do we know *what we know*?" [Emphasis is added]. The emphasis in the third question shows that the author avoids the use of the term "reality" or "truth" because, there is no general agreement on what "reality" is. It is what constitutes acceptable knowledge in a particular field of study (Bryman, 2004; Saunders et al. 2007). Epistemological assumptions are associated with the nature of knowledge and the methods through which we gain that knowledge (Bahari, 2010, p. 22). There is therefore an epistemological basis for any research, be it explicitly stated or implicitly hidden in the study

3.1.1.3. Methodology

A third component of a paradigm is methodology. It is the model of undertaking a research process (Wahyuni, 2012). As Keeves (1997) explains, it is a broad term used to refer to research design, methods, approaches and procedures used in an investigation that is well planned to find out something (as cited in Kivunja & Kuyini, 2017). Research methodology should not be confused with research methods which encompass the forms of data collection, analysis and interpretation that researchers propose for their investigation (Creswell and Creswell, 2018). While making methodological assumptions, researchers should ask such question: "How shall I go about obtaining the desired data, knowledge and understandings that will enable me to answer my research question and thus make a contribution to knowledge?"

3.1.1.4. Axiology

The term axiology is used in research to refer to ethical issues. It involves defining, evaluating and understanding concepts of *right* and *wrong* behaviour in relation to the research (Kivunja

& Kuyini, 2017) [emphasis is added]. In line with this, Wahyuni (2012), argues that axiology is concerned with ethics and encompasses the role of values in the research and the researcher's stance in relation to the subject studied. A consideration of axiology in research leads the inquirer to ask the following ethical questions: What values will you live by or be guided by as you conduct your research? What ought to be done to respect all participants' rights? What are the moral issues and characteristics that need to be considered? Which cultural, intercultural and moral issues arise and how will I address them? How shall I secure the goodwill of participants? How shall I conduct the research in a socially just, respectful and peaceful manner? How shall I avoid or minimize risk or harm, whether it be physical, psychological, legal, social, economic or other? (ARC, 2015, as cited in Wahyuni, 2012).

3.1.2. Major Research Paradigms

There are four major paradigms which are widely discussed in literature: Positivism, constructivism, pragmatism, and transformative (Creswell and Creswell, 2018,). The discussion below is concerned with the first three.

3.1.2.1. Positivism/Postpositivism Paradigm

Positivism is based on the ontological assumption that there is a single reality and that reality can be measured and known. To put it differently, positivists support the fact that the world around us is real, and that we can find out about these realities (Walliman, 2017). Taken in this sense, reality or truth is free and independent from the viewer and observer (Aliyu, Bello, Kasim, & Martin, 2014). This paradigm works more with quantitative research than qualitative research (Creswell & Creswell, 2018,). Positivists believe that different researchers observing the same factual problem will generate a similar result by carefully using statistical tests and applying a similar research process in investigating a large sample (Creswell 2009, cited in Wahyuni, 2012). Postpositivism has much in common with positivism. However, it (postpositivism) challenges the traditional notion of absolute truth and accepts the fact that we cannot be absolutely positive about our claims of knowledge when investigating the behaviour of actions and humans (Creswell & Creswell, 2018).

3.1.2.2. Constructivist paradigm

Constructivist (or interpretivist) paradigm is based on relativist ontology. It assumes that there is no single reality or truth. Reality needs to be interpreted rather than measured. Indeed, constructivists or interpretivists believe that reality or truth is constructed by social actors and

people's perceptions of it (Wahyuni, 2012). Researchers who take a constructivist approach accepts that reality is constructed by the human mind and is therefore subjective. Reality is therefore experienced personally through our perceptions which are influenced by our preconceptions, beliefs and values (Walliman, 2011). This leads us to multiple realities rather than a single reality. This paradigm is typically associated with the qualitative approach. Those who adopt a constructivist or interpretivist perspective tend to gain a deeper understanding of the phenomenon and its complexity in its unique context instead of trying to generalize the base of understanding for the whole population (Creswell, 2007, as cited in Pham, 2018).

3.1.2.3. Pragmatic Paradigm (the philosophical basis of the present study)

Pragmatic paradigm circumvents the continuous metaphysical discussion around the issue of reality or truth (Kaushik & Walsh, 2019; Yvonne Feilzer, 2010). It is therefore not committed to anyone system of philology or reality (Creswell & Creswell, 2018). It accepts that there can be single or multiple realities that are open to empirical inquiry (Creswell & Clark, 2011, as cited in Kaushik & Walsh, 2019). In that sense, it is pluralistic. Indeed, 'instead of focusing on the research method, researchers emphasize on their research problem and questions and makes use of all available approaches to understand the problem.' (Creswell & Creswell, 2018, p. 10). Pragmatist researchers have freedom of choice. They are free from mental and practical constraints imposed by the "forced choice dichotomy between postpositivism and constructivism" (Creswell & Plano Clark, 2007, as cited in Yvonne Feilzer, 2010). They (researchers) do not have to "be the prisoner of a particular method or technique" (Robson, 1993, as cited in *ibid*). To put it another way, they can freely choose the methods, techniques and procedures that best respond to their needs and purposes. Pragmatic paradigm is typically associated with mixed-methods research which is a combination of quantitative and qualitative research methods.

3.2. Research Design

The present study adopted a mixed-methods design. According to Creswell and Plano Clark (2018), a mixed-methods research design is a procedure for collecting, analysing and mixing both quantitative and qualitative data in a single study or a series of studies to understand a research problem. There exist in the literature several terms used to refer to this approach: *multimethod*, *integrating*, *methodological triangulation*, *multi-methodological research*, *quantitative and qualitative methods*, etc. (Creswell & Creswell, 2018; Gunasekare, 2015).

The rationale behind the choice of a mixed-methods design is to avoid or minimize the weaknesses or limitations of both qualitative and quantitative methods. To put it another way, when both quantitative and qualitative data are included in a study, researchers are very likely to strengthen their results in ways that one form of data does not allow (Hanson, Creswell, Clark, Petska, Creswell, 2005). Therefore, a combination of both qualitative and quantitative data will help researchers to develop a more complete understanding of a problem.

Johnson and Turner (2003, as cited in Gunasekare, 2015), provide some useful advice on how to do mixed-methods research. They explain that a researcher should collect multiple sets of data using different research methods, epistemologies, and approaches in such a way that the resulting mixture or combination has complementary strengths and non-overlapping weaknesses.

In the present study, the mixed-methods design was adopted to help the researcher get a comprehensive picture of the students' English language needs as they are perceived by different stakeholders. Indeed, Needs Analysis data can derive from a number of instruments including questionnaires, interviews, observations of interactions and analysis of language use in the target situation, etc. (see for example Basturkmen, 2010; Brown, 2016).

There exist different types of mixed-methods research design (e.g. convergent design, explanatory sequential design). The type a researcher chooses will be determined by how both type of data (qualitative and quantitative) will be collected (simultaneously or sequentially, i.e., in phases) and the rationale behind using both data (comparing or explaining) (Creswell & Creswell, 2018; Hanson, Creswell, Clark, Petska, Creswell, 2005). This study adopted a convergent or concurrent triangulation mixed-methods design in which both quantitative and qualitative data were collected simultaneously (Hanson, Creswell, Clark, Petska, Creswell, 2005). For this type, the data analysis is usually separate, and integration usually occurs at the data interpretation stage which typically involves discussing the extent to which the data triangulate or converge (ibid.). This design helps the researcher to confirm, cross-validate, and corroborate the findings of the study.

3.3. Participants in the Study

Needs Analysis studies usually investigate the perception of language needs from different parties or sources of information (Dudley-Evans & St. John, 1998; Hutchinson, & Waters, 1987; etc.). These parties range from students to teachers and to other stakeholders. The

participants in this study are students, subject specialist teachers, ESP teachers and policymakers. These groups constitute, as Brown (2016) explains, the key stakeholders in the Needs Analysis studies.

3.3.1. Students

The student population of this study consisted of Natural Science students at the two main public higher education institutions in Burundi, namely the University of Burundi (UB) and the Burundi Higher Institute of Education (BHIE). These students were studying in the Faculty of Sciences at UB and the Department of Natural Sciences at BHIE. Since the English course is taught in first and second years, the researcher decided to include second year students (academic year: 2018-2019) after they had completed the English course. The total number of second year students during the academic year 2018-2019 was 417 and they were studying in 9 classes as the Table 3.1 indicates.

Table 3.1: Second Year Natural Science Students at UB and BHIE, A/Y 2018-2019

Institution	Field of Study	Number of Students	Total
UB	Maths	19	134
	Biology	45	
	Chemistry	23	
	Physics	18	
	Geology	29	
BHIE	Maths	111	283
	Biology-Chemistry	92	
	Physics-Technology	37	
	Geography	43	
TOTAL (Sample frame)			417

3.3.1.1. Selection of the Students

To select students, this study used a stratified sampling technique. Stratified sampling is a form of probability sampling in which a population is divided into subgroups (strata) and then a sample is selected from each subgroup (stratum) using simple random sampling (Creswell & Guetterman, 2019). To put it another way, a sample is selected randomly from each stratum based upon the percentage (or proportion) that each subgroup represents in the population. In

the present study, the classes were considered as subgroups. As the total number of 2nd Year natural science students was 417, the researcher had to determine first how many of these students would be selected to constitute a representative sample. To do so, he used an online sample size calculator owned by *Survey Monkey* (see <https://www.surveymonkey.com/mp/sample-size-calculator/>). The representative sample from the 417 students turned out to be 201 students. However, assuming that the response rate would be 75%, the sample size was increased to 252. The following table indicates the number of students that were proportionally selected from each stratum. The students were selected using an online randomizer (<https://www.randomizer.org/>)

Table 3.2. Number of Students Proportionally Selected from each Class

Institution	Field of Study	Number of Students	Selected students	Total of selected students
UB	Maths	19	11	81
	Biology	45	27	
	Chemistry	23	14	
	Physics	18	11	
	Earth Science	29	18	
BHIE	Maths	111	67	171
	Biology- Chemistry	92	56	
	Physics- Technology	37	22	
	Geography ⁹	43	26	
TOTAL				252

⁹ Geography was considered among Natural Sciences because one of its major branches (Physical Geography) occupies a distinctive place among natural sciences as argued by Yefremov (1964)

3.3.2. Subject Specialist Teachers

The subject specialist teacher's population of this study were science teachers in the Faculty of Sciences at UB and in the Department of Natural Sciences at BHIE. For subject specialist teachers, the researcher decided to use convenience sampling. According to Creswell and Guetterman (2019, p. 143), in convenience sampling, 'the researcher selects participants because they are willing and available to be studied'. The researcher decided to use this type of sampling for two reasons. First, he was unable to get an updated list of all in-service teachers; the lists he obtained included retired teachers and those who were still abroad for study reasons. Second, since the teachers concerned were not many, the researcher could afford to include all of them. For these two reasons, all the subject specialist teachers that could be reached were included in the study. Thus, a total number of 90 questionnaires were distributed to subject specialist teachers.

3.3.3. ESP Teachers

There were five ESP teachers in Natural Sciences at the two institutions, that is, 2 at UB and 3 at BHIE. One of these five ESP teachers had a science background (a science degree). All the five teachers were contacted to participate in the study.

3.3.4. Policymakers

Policymakers were also included in this study. This category of respondents included 15 members of the National Commission for Higher Education, 2 Academic Affairs Directors, 2 Research Directors, and 2 Quality Assurance Directors, the Dean of the Faculty of Sciences at UB, the Head of Natural Science Department at BHIE, the Rector of UB and the Director General of BHIE. They were all contacted to participate in this study. It is worth mentioning that some of the policymakers are also teachers. Therefore, in the distribution of the questionnaire, the researcher made sure that they received only the questionnaire for policymakers. In total, 25 policymakers were sent a link to the online questionnaire.

3.4. Data Collection

The data were collected by means of a number of instruments: Questionnaires, interviews, consultation of existing documents. The use of different instruments in research is typically associated with the mixed-methods approach and the pragmatic philosophical underpinning

which opens the door to multiple methods, different paradigms, different assumptions and as well as different forms of data collection (Creswell & Creswell, 2018). The use of different instruments is advisable because any one source of information is likely to be incomplete or partial (Richards, 2001). This is called a triangular approach (ibid) and is commonly used in Needs Analysis studies.

3.4.1. Questionnaires

As Richards (2001) explains, questionnaires are one of the most common instruments used in research. The reasons behind the use of questionnaires is that (1) they are relatively easy to design, (2) they can be used with a large number of respondents, and (3) the information obtained via questionnaires is relatively easy to tabulate and analyse (ibid). Another advantage of using questionnaires, compared with interview, is that they offer flexibility. This is because respondents can complete a questionnaire in their own time, at their own pace, and fit it into their schedule (Brown, 2001). Questionnaires can therefore be efficient in saving the researcher's time, effort and financial means (Dornyei, 2003).

In the present study, a questionnaire was used with students, teachers and policymakers. The teachers' and the students' questionnaires were much similar in content but the wording was adapted according to the respondents. The reason for this was to allow the comparison of respondents' perception of the needs. Since the questionnaire for policymakers was administered online, it was shortened so as to maximize the response rate.

3.4.1.1. Construction of the Questionnaires

The questionnaires were constructed by referring to previous studies and literature on Needs Analysis (Alfehaid, 2011; Alharby, 2005; Dudley-Evans & St John, 1998; Hutchinson, & Waters, 1987; Ibrahim, 2016; Boroujeni & Fard, 2013; etc.). Ronald and Johnny (1996) explain that when developing questionnaires, it is acceptable and even encouraged to borrow questions from other researchers. This is to avoid the reinvention of the wheel and allow the comparison of the studies.

The students' questionnaire (see Appendix 3) collected information about (1) their attitudes towards learning English, (2) their awareness of the status of English language worldwide, (3) the reasons for learning English, (4) the target situations in which they use the English language at university, (5) the prospective target situations, (6) their perception of the important skills and strategies, (7) their level of knowledge in the skills and strategies, (8) their beliefs about

language learning, (9) their views on the strategies to improve the knowledge of English in general, and (10) their evaluation of the English course. The subject specialist teacher's questionnaire (see Appendix 4) collected the same information except that in (10). That of policymakers (see Appendix 5) included only information in (1) and (2) with some additional questions relevant to policymakers. The questionnaires for students, teachers and policymakers were translated into French to allow ease of responding on the part of the students.

3.4.1.2. Piloting of the Questionnaires

Piloting or pretesting the questionnaire is of paramount importance and has several functions. Some of these functions are (see Cohen, Manion & Morrison, 2017), (1) to check the clarity of the questionnaire items, instructions and layout; (2) to eliminate ambiguities or difficulties in wording; to check readability levels for the target subjects; (3) to check whether the questionnaire is too long or too short, too easy or too difficult; (4) to gain feedback on the type of questions and on its format (e.g. rating scale, multiple choice, open, closed etc.); etc.

The questionnaires were piloted (or pretested) for clarity, readability of the answering. The researcher first conducted an informal pre-test. Two people not involved in the construction of the questionnaire were asked to read the questionnaires and provide their feedback on the clarity, readability and comprehensiveness. Their comments were used to improve the questionnaires before the formal piloting. In formal piloting, 15 students and 4 teachers were asked to complete the questionnaires and provide feedback. Their feedback helped the researcher to identify ambiguous and difficult questions.

3.4.1.3. Administration of the Questionnaires

The student questionnaire was administered to 251 Natural Science students that were selected using stratified random sampling as explained in section 3.4.1.1 above. The researcher used group administration during lecture time. Lecturers were contacted in advance to allow the researcher to administer the questionnaire during their lecture time. In each class, the administration took between 10 and 15 minutes.

The teachers' questionnaires were administered using two ways. First, a one-to-one administration was used at BHIE. Second, at the UB in the Faculty of Science, there are mail boxes available for teachers. With the help of secretaries of the faculty, the researcher deposited the questionnaires in the boxes. Attached to the questionnaires was a cover letter that was intended to explain the purpose of the study.

3.4.2. Interviews

Besides the questionnaire, interview is another instrument that is commonly used in Needs Analysis studies. One of the advantages of using interview is that, unlike questionnaires, it provides flexibility of responses to the interviewee (Walliman, 2011). The interview was used with students and teachers.

The type of interview used in this study is semi-structured interview. This type of interview is non-standardized and is frequently used in qualitative methods (Kajornboon, 2005). Semi-structured interviews are ‘organized around a set of predetermined open-ended questions, with other questions emerging from the dialogue between interviewer and interviewee’ (DiCicco-Bloom & Crabtree, 2006, as cited in DeJonckheere & Vaughn, 2019).

In the semi-structured interview, the researcher has key themes, issues, and questions to be dealt with. According to DeJonckheere & Vaughn (2019); this type of interview is effective when the researcher wants: (1) to collect qualitative, open-ended data; (2) to explore participants’ thoughts, feelings and beliefs about a particular topic; and (3) to delve deeply into personal and sometimes sensitive issues. Corbetta (2003, as cited in Kajornboon, 2005) explains that within each topic, the interviewer is free to conduct the conversation as he thinks fits, to ask the questions he deems appropriate in the words he considers best, to give explanations and ask for clarification if the answer is not clear, to prompt the respondent to elucidate further if necessary. The interviewer can ask additional questions that may not have been anticipated at the beginning of the interview.

Before conducting the interviews, the researcher prepared interview guides. To ensure the validity of the interview, the interview guide was sent via e-mail to two experts in ESP to request their feedback. One expert was affiliated to the University of Wellington, Victoria, New Zealand; and another to Saint Petersburg University, Russia. Their feedback helped to improve both the content and the wording of the interview guide. The interview guides were then translated into French (for teachers) and in Kirundi (for students).

3.4.2.1. Interview with Students

The student interview was conducted to get a deep understanding of these major themes: (1) importance of teaching/learning English in science departments, (2), target situations in which learners (will) use the language, (3) their receptions of the needs in terms of skills, strategies,

activities, (4) methodology used by teachers, (5) their appraisal of the ESP course taught in their domain (see Appendix 6).

In the present study, the researcher conducted 27 interviews with students, that is, 3 interviews per class. The researcher selected 3 volunteers from each class. Before conducting the interview with students, the researcher conducted 3 pilot interviews. Two were conducted in French, and one in Kirundi. The reasons behind piloting the interview was (1) to ensure that students would feel comfortable to speak in French, (2) to ensure that there were no ambiguities in the questions, (3) to have an idea about how long each interview would last.

After the piloting interview session, the researcher found out that:

- Unlike the student interviewed in Kirundi, the two students interviewed in French had difficulties to speak. They could not express themselves freely and the information they provided was therefore limited. For this reason, the researcher decided to conduct student interview in Kirundi to allow students to speak naturally and spontaneously.
- Each interview would take between 15 and 25 minutes.

To carry out the interviews, the students were contacted by telephone and were asked to propose the convenient time and place for the interview. With the permission of the students, the interviews were audio-taped. They were then transcribed and translated into English in order to constitute raw qualitative data to be analysed.

3.4.2.2. Interview with Subject Specialist Teachers

The interview with subject specialist teachers (see Appendix 7) covered the same themes as those for student interview, except that there was an additional theme regarding the use of English language in the teachers' profession. At first, the researcher planned to include 9 subject specialist teachers for interview, that is, one teacher per class. The teachers were contacted via e-mail or in person. However, many of the teachers contacted proved unwilling to participate. Only 4 accepted to be interviewed, that is, 2 at UB and 2 at BHIE. Before the interview, the researcher asked permission to record their voice and they all accepted. The interviews were conducted in French. They were then translated into English.

3.4.2.3. Interview with ESP Teachers

The interview with ESP teachers (see Appendix 8) covered the following themes: (1) Importance of teaching/learning English in science departments, (2) Target situations in which learners use/will use the language, (3) perceptions of the needs, language difficulties, (4) contents of the course, (5) selection of the contents, (6) methodology they use, and (7) materials used. Three teachers accepted to participate in the interview, 1 from UB and 2 from BHIE. Since they teach English, the interviews were conducted in English. All the interviewed ESP teachers allowed the researcher to use a recorder. The interviews were then transcribed for analysis.

3.4.3. Other Documents Collected for Analysis

The data were also collected from existing documentation to help the researcher get a comprehensive picture of the needs of the students. These were course descriptions for the English course as were found in the programmes of Natural Science departments. These course descriptions were initially prepared for accreditation by the National Commission for Higher Education.

3.5. Validity and Reliability

3.5.1. Validity

To ensure the validity of the questionnaires, they were constructed by drawing on previous studies on Needs Analysis. Therefore, different Needs Analysis questionnaires were adopted. Besides, a feedback on the questionnaires was asked from colleagues and friends. They were asked to check for clarity, readability and comprehensiveness. Their feedback was considered to improve the quality of the questionnaires.

As far as interviews are concerned, the interview guides were sent to three senior scholars in the field of ESP. Two of them proved willing to provide feedback. One was from the Victoria University of Wellington, New Zealand; another was from St Petersburg State University, Russia. Their feedback was very useful in improving the interview guides.

3.5.2. Reliability

As the questionnaire consisted of many sections with items measured on different scales (scales of points ranging from 2 to 5), the reliability was measured for each section of the questionnaire. It was measured using Cronbach's alpha. The results presented in Table 3.3 show that the

Cronbach's alpha coefficient for the different sections of the questionnaire ranges from ($r=.53$) to ($r=.94$). Basing on the criteria (for interpreting alpha coefficient) given by some scholars (e.g. Goforth¹⁰, 2015; Salvucci, Walter, Conley, Fink, & Saba, 1997), the reliability is acceptable for all the sections of the questionnaire. It is worth noting that the standards for interpreting alpha coefficient are entirely arbitrary (Goforth, 2015; Taber 2017). There is, therefore, still no general agreement in the interpretation of Cronbach's alpha. This lack of common standards is reflected in a number of different 'qualitative descriptors' used by authors to interpret the value of alpha as they are reported in Taber (2017)¹¹.

Table 3.3: Cronbach's Alpha Coefficient for Different Sections of the Questionnaire

Nº	Construct measured	Cronbach's alpha coefficient
1	Attitude towards learning English	.62
2	Awareness of the status of English	.58
3	Reasons for learning English	.53
4	Target situations	.73
6	Importance of the main language skills and aspects	.86
7	Importance of sub-skills and strategies	.93
8	Level of knowledge in skills and strategies	.94
9	Beliefs about language learning	.67
10	Views on the strategy to improve knowledge of English	.64
11	Satisfaction with the ESP course in terms of main language skills and aspects	.88
12	Methods used by teacher	.53
13	Satisfaction with the ESP Course in General	.79

¹⁰ Many methodologists recommend a minimum alpha coefficient between 0.65 and 0.8 and that coefficients that are less than 0.5 are usually unacceptable.

¹¹ Taber, (2017) explored the qualitative descriptors used by authors to report the alpha values in volumes of 2015 of four leading journals in science education (IJSE, JRST, RISE, SE). The results indicated that a wide range of different qualitative descriptors was used by authors to interpret alpha values calculated. Alpha values were described as excellent (0.93–0.94), strong (0.91–0.93), reliable (0.84–0.90), robust (0.81), fairly high (0.76–0.95), high (0.73–0.95), good (0.71–0.91), relatively high (0.70–0.77), slightly low (0.68), reasonable (0.67–0.87), adequate (0.64–0.85), moderate (0.61–0.65), satisfactory (0.58–0.97), acceptable (0.45–0.98), sufficient (0.45–0.96), not satisfactory (0.4–0.55) and low (0.11).

3.6. Data Analysis Procedures

As explained above, this study adopted a mixed-methods design, hence the data were collected using a number of instruments: questionnaire, interview, and consultation of existing documentation. The quantitative data collected via questionnaires were coded and processed using a statistical data analysis tool (IBM SPSS version 22). They were then analysed by means of descriptive and inferential statistics.

To analyse the data collected from the interview, the researcher used a qualitative data analysis software (Weft QDA). This software was chosen because it is freely available and relatively easy to use compared to other types of software. The interviews were first coded and then analysed using thematic analysis. In order to answer the research questions of the present study, the results from questionnaires and interview were merged in the section of the discussion of the findings. They were completed by the results from the analysis of existing documentation.

3.7. Ethical Considerations

Ethical issues are now an important topic in research. These issues should be considered at all stages of the research process including data collection, data analysis and interpretation, and publication of the research findings (Creswell & Guetterman, 2019; McDonough & McDonough, 1997). In the present study, the following ethical practices were considered:

- The researcher asked for permission to get access to the research sites
- Although the researcher did not prepare a consent form for the participants, they were informed about the main purpose of the study. They were also told that they could participate only if they were willing.
- Participants were assured that the information they provided would be used for only research purposes.
- The questionnaires were kept anonymous to allow the respondents answer freely.
- Before conducting interviews, the researcher requested participants' consent to use a recorder.
- Participants who wanted it were given an audio version of the interview to check for any private or sensitive information that could potentially cause harm when reported.
- In reporting the results, the privacy and anonymity were guaranteed.

Conclusion

This chapter described in detail the methodology used in this study. The researcher started by discussing the philosophical basis that guided this study. Due to the nature of the problem under investigation, it is the pragmatic paradigm that guided the researcher in the choice of mixed-methods as a research design of the study. It is worth reminding the reader that the pragmatic worldview accepts that there can be single or multiple realities that are open to empirical inquiry. As a result, the researcher is not dogmatically constrained by any research methods, s/he rather focuses on their research problem and questions and makes use of all available approaches to understand the problem.

As the mixed-methods design was adopted in this study, the data were collected by means of a number of instruments (questionnaire, interview, existing documents) and from different groups (students, teachers and policymakers). This is usually referred to as triangulation of instruments and sources of information. In total, 251 written questionnaires were administered to students, 90 to teachers and 25 policymakers were sent a link to the questionnaire. As far as interviews are concerned, 27 students were included, 4 subject specialist teachers and 3 ESP teachers.

The collected data were analysed using specific data analysis software namely the IMB SPSS 22 (for quantitative data) and Weft QDA (for qualitative data). This chapter ended with a note on ethical considerations. The following chapter is concerned with the presentation and analysis of the obtained findings.

Chapter Four: Presentation and Analysis of the Findings

Introduction

In this chapter, results are only presented and analysed; they are not discussed¹². The chapter is organized in two sections. Section one presents the results from the different questionnaires, that is, questionnaire for students, teachers and policymakers. The second section focusses on the analysis of the qualitative data. It presents the findings from both interview and the analysis of existing documentation.

Section 4.1: Findings from Quantitative Data

This section deals with the analysis of the quantitative data obtained from questionnaires. The results are presented by means of tables and graphs. In the first instance, the different questionnaires are analysed separately using only descriptive statistics such as mean, standard deviation, frequencies and percentages. In the second instance, inferential statistics are used to compare the results from the questionnaires. It is notable however that only similar sections in the questionnaires are compared to see whether there is a significant difference among students, teachers and policymakers in their perception of the English language needs of Natural Science students.

4.1.1. Criteria for Interpreting the Mean Scores of Likert Scale Data

Many of the sections of the questionnaires were put on a Likert scale to measure the constructs such as importance, level of knowledge, attitudes, extent, frequency and agreement. Some of these constructs were measured using a 4-point Likert scale and others were measured on a 5-point Likert scale. Although there is still a debate among scholars on whether to use parametric or non-parametric tests in analysing Likert scale data, this study adopts Murray's (2013) study and Carifio's and Perla's (2008) position. These authors believe that it is perfectly appropriate to analyse Likert scale data using mean and standard deviation or other parametric tests like ANOVA, or other analytical techniques such as multiple regression, factor analysis etc.

¹² In this chapter, the findings are not discussed since the next chapter is devoted to the discussion of these findings.

To interpret the mean scores obtained from Likert scale data, this study drew on Oxford's (1990) frequency scale which was then adapted to other constructs (importance, level of knowledge, etc.). Table 4.1 provides more details on how the mean scores were interpreted for the different constructs

Table 4.1: Interpretation of the Mean Scores

What to measure	N° of points	Mean score	Interpretation
Importance	4	1.0-1.4	Not important
		1.5-2.4	Slightly important
		2.5-3.4	Quite important
		3.5-4.0	Very important
Level of knowledge	5	1.0-2.4	Weak/poor
		2.5- 3.4	Average/Fair
		3.5-5.0	Good
Attitudes	5	1.0-2.4	Negative
		2.5- 3.4	Moderate
		3.5-5.0	Positive
Extent (how much the ESP course helped students)	4	1.0-1.4	No help at all
		1.5-2.4	To a small extent
		2.5-3.4	To some extent
		3.5-4.0	To a great extent
Frequency	5	1.0-2.4	Low
		2.5- 3.4	Medium
		3.5-5.0	High
Agreement	5	1.0-2.4	Disagree

2.5- 3.4	Neutral
3.5-5.0	Agree

4.1.2. Analysis of Data from Student Questionnaire

As said above, the students that participated in this study are Natural Science students from the UB and BHIE. The Questionnaire was administered to 251 students. Since some students did not respond to the questionnaire, the valid returned questionnaires added up to 173, that is, a response rate of 68.92 %. Of those who responded to the questionnaire, 37. 6% were studying at UB and 62. 4% BHIE. Table 4.2 below provides more details about students who responded to the questionnaire.

Table 4.2: More Details about Students who Responded to the Questionnaire

			Institution		
			UB	BHIE	Total
Field of Study	Maths	Count	5	33	38
		% within Field of Study	13.2%	86.8%	100%
	Physics	Count	7	19	26
		% within Field of Study	26.9%	73.1%	100%
	Chemistry	Count	10	0	10
		% within Field of Study	100%	0%	100%
	Biology	Count	30	0	30
		% within Field of Study	100%	0%	100%
	Bio-Chemistry	Count	0	31	31
		% within Field of Study	0%	100%	100%
	Earth Science (Geology)	Count	13	0	13
		% within Field of Study	100%	0%	100%
	Geography	Count	0	25	25
		% within Field of Study	0%	100%	100%
	Total	Count	65	108	173
		% within Field of Study	37.6%	62.4%	100%

4.1.2.1. Analysis of Students' Attitudes towards Learning English Language

To measure students' attitudes towards learning English, the researcher asked them to say how much they agree on 8 statements describing attitudes towards learning English. They were given 5 choices ranging from "Strongly disagree" to "Strongly agree". The findings are presented in Table 4.3 below.

Table 4.3: Students' Attitudes towards Learning English Language

N°	Item in the questionnaire	N	Mean	SD	Interpretation
1	People who are good at natural science (ex: Maths, Physics, Chemistry and Biology) are not good at learning English.	172	3.87	1.13	Positive
2	I attend English classes just to avoid absences.	173	4.32	.75	Positive
3	I attend English classes just to get a good mark in exam.	172	3.56	1.26	Positive
4	In my opinion, English is a very difficult language and is therefore complicated to learn.	172	3.94	1.15	Positive
5	When I am speaking in English, I have fear of making mistakes.	171	2.88	1.30	Moderate
6	I believe English is the language of Arts students, not science students.	168	4.19	.98	Positive
7	I regret the time I spend when learning English at University.	172	4.28	.81	Positive
8	I would like the English course to be optional rather than compulsory.	171	3.33	1.28	Positive
Overall Mean Score		173	3.80	.58	Positive

As indicated in the Table 4.3, the overall mean score is 3.80 (SD= .58). This means that natural science students have an overall positive attitude towards learning the English language. Indeed, the table indicates that all the statements, with the exception of statement 5, scored

higher than 3.5. Statement 5 which scored the lowest (Mean=2.88, SD=1.30) shows that many students agreed that they have fear of making mistakes, when they are speaking in English.

4.1.2.2. Students' Awareness of the Status of English Worldwide

To evaluate students' awareness of the status of English language, students were given 10 statements describing the status of English and were given three choices to respond (Yes, NO, Not Sure). Most of the statements were drawn from Graddol's (2000) "Future of English" published by the British Council . The results are presented in Table 4.4:

Table 4.4: Students' Awareness of the Status of English Language Worldwide

N°	Statements	Yes	No	Not Sure	Total
		%	%	%	%
1	English is an international language of science and research.	65.9	17.9	16.2	100
2	There is an increase in the use of English as a medium of instruction worldwide especially in tertiary education.	54.1	19.8	26.2	100
3	English is closely associated with leading-edge technology.	61.6	15.7	22.7	100
4	English is the working language of international organizations and conferences.	62.6	20.5	17.0	100
5	English is the working language of international banking, economic affairs and trade.	54.1	19.8	26.2	100
6	English is the global language of internet/electronic communication	52.3	27.9	19.8	100
7	English is the working language of international law.	37.2	27.3	35.5	100
8	English is the language of international tourism.	48.8	19.6	31.5	100

9	English is a global lingua franca, that is, a language used for communication between people whose native languages are different from one another.	51.2	37.1	11.8	100
10	English is the number one international language of publishing.	44.5	30.1	25.4	100
Average		53.2	23.6	23.2	100

As indicated in Table 4.4 above, the average percentage of students who responded “Yes” to the statements altogether is slightly higher than 50%. This shows that students are moderately aware that English is a global language in many domains. Their awareness is still far from high and should therefore be increased. For example, many students still do not know that English is the main international language of scientific publications, nor do they know that it is a global language of the tourism industry and international law.

4.1.2.3. Reasons for Learning English at University

In this section, students were given 13 statements describing the reasons for learning English language at University. They were then asked to respond by choosing between “Yes”, “No”, and “Not Sure”. The results are presented in Table 4.5 below in a descending order of the percentage of “Yes” answers.

Table 4.5: Reasons for Learning English Language at University

N°	At university, I study/should study English....	Yes	No	Not Sure	Total
		%	%	%	%
1	Because I will need English to travel abroad.	85.5	9.3	5.2	100
2	Because English will give me more job opportunities in the East African Community (EAC) and elsewhere	79.8	12.7	7.5	100.
3	Because I will need to discuss with foreign specialists in my domain	78.5	9.3	12.2	100
4	Because English is the most spoken second language in the world	69.8	17.4	12.8	100

5	Because I would like to work in international companies	63.7	21.1	15.2	100
6	Because I plan to continue my studies abroad at English medium universities	61.8	23.1	15.0	100
7	Because I intend, in the future, to publish in English	61.8	18.8	19.4	100
8	To get access to academic and scientific sources (books) published in English.	59.9	27.9	12.2	100
9	Because English is a gateway to the world of science, commerce and culture	46.5	27.1	26.5	100
10	To increase the chance to get a scholarship to study abroad.	44.7	37.1	18.2	100
11	Because if I learn English I will become better educated.	40.7	27.3	32.0	100
12	Because English is a global language of science	39.6	45.0	15.4	100
13	Because I just need it to obtain my university degree.	25.4	57.8	16.8	100

The above table indicates that 8 out of 13 items obtained a Yes-answer percentage greater than 59%. If Yes-responses are combined with “Not-sure” responses, 11 out of the 14 students obtain a frequency greater than 60%. This indicates that students are aware of the reasons for learning English. This awareness is therefore likely to increase the motivation to learn the English language.

The above table also shows that a large majority of students who responded to the questionnaires (85.5%) accepted that they study/should study the English language because they will need it when they travel abroad. The other reasons which obtained a high Yes-percentage of the respondents are: (a) getting more job opportunities in the East African Community (EAC) and elsewhere (79.8%), (b) talking about their domain with foreign specialists (78.5%), (c) English is the most spoken second language in the world (69.8%), (d) working in international companies (63.7%), (e) continuing their studies abroad at English-medium universities (61.8%), and (f) publishing in English in the future (61.8%). The table also indicates that the majority of students reject the reason that they study English just to obtain their university degree.

4.1.2.4. Analysis of the Target Situations (Current/Future Situations)

This section was intended to identify the situations (current/future) in which students use/will use the English language. They were asked to choose between “Yes” and “No” to respond to 15 items representing the situations. The findings are presented in Table 4.6 below and are put in the descending order of the Yes-answer percentage.

Table 4.6: Target Situations as Perceived by Students

	N°	Situations	Yes	No	Total
			%	%	%
Current Situations	1	To listen to scientific documentaries in English	93.1	6.9	100
	2	To interact with English speaking foreigners	92.5	7.5	100
	3	To read the handouts/notes/syllabi that are given in English	83.2	1.8	100
	4	To search for internet resources	75.1	24.9	100
	5	To read science textbooks that are in the library	64.7	35.3	100
Future/Projected Situations	1	To do a job interview in English	90.2	9.8	100
	2	To attend conferences in English	89.6	10.4	100
	3	To travel to an English-speaking country	83.2	16.8	100
	4	For work in the East African Community	82.7	17.3	100
	5	To understand documents related to your speciality.	82.1	17.9	100
	6	For work in a multinational company or institution	80.2	19.8	100
	7	To travel abroad	78.0	22.0	100
	8	To complete forms and official documents in English	73.8	26.2	100,
	9	To make online application for scholarship to study abroad	72.8	27.2	100

10	To continue your studies (master and/or doctorate)	61.0	39.0	100
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With regard to the current situations, all the items obtained a Yes-answer percentage higher than 60%. This indicates that a large majority of students who responded to the questionnaire confirmed that they currently use English in listening to scientific documentaries in English, interacting with English speaking foreigners, reading handouts/notes/syllabi that are given in English; searching for internet resources, and reading science textbooks that are in the library.

As far as future/ projected situations are concerned, the Table 4.6 also shows that the Yes-answer percentage for all the items is above 60%. Six main situations in which students envisage to use English in their future are: doing a job interview in English (90.2%), attending conferences in English (89.6%); travelling in an English-speaking country (83.2); working in the East African Community (82.7%), and understanding [reading] documents related to their specialty (82.1%); work in a multinational company or institution (80.2%).

4.1.2.5. Students' Perception of the Language Needs

This part of the questionnaire was intended to examine students' perceptions of (1) the importance of the main language skills and aspects for their studies and for their prospective job, (2) the importance of subskills and strategies. It was also intended to determine their self-evaluated level of knowledge in the subskills and strategies. Both the importance and level of knowledge were measured on a four-point Likert scale ranging respectively from "Very important" to "Not important at all" and from "Very weak" to "Very good".

4.1.2.5.1. Students' Perception of the Importance of the Main Language Skills and Aspects

As said above, the importance of the main skills and aspects was measured on a four-point scale ranging from "Very important" to "Not important at all". The findings are presented in Table 4.7 below.

Table 4.7: Importance of the Main Language Skills and Aspects for Students' Studies

N°	Main Skills and Aspects	N	Mean	SD	Interpretation
1	Reading and understanding	149	3.67	.69	Very important

2	Writing	147	3.33	.83	Quite important
3	Listening	145	3.41	.87	Quite important
4	Speaking	147	3.51	.85	Very important
5	Scientific/Technical vocabulary	147	3.15	.99	Quite important
6	English grammar	147	3.17	1.03	Quite important
7	Pronunciation	148	3.38	.94	Quite important

The results presented in Table 4.7 show that all the seven items have a mean score that is higher than 3.0. This indicates that Natural Science students who responded to the questionnaire see the importance of the main language skills and aspects. From the same table, it can be seen that item 1 (reading and understanding) scored the highest (Mean=3.67, SD= .69). This implies that students perceive reading as the most important skill for their study. It should be noted, however, that in terms of target situations, listening to documentaries obtained a higher Yes-answer percentage. A tentative explanation to this inconsistency is that currently students get exposed more to the English language via listening documentaries¹³ compared with any other medium. This may, however, still not change their view of the importance of reading and understanding especially for their studies.

Regarding the macro skill of speaking, it was ranked the second most important skill for students' studies (Mean= 3.51, SD= .85). Table 4.7 also revealed that scientific/technical vocabulary was perceived as important for students' studies, though it scored the lowest (Mean=3.15; SD= .99).

As far as the importance of main language skills and aspects for students' future career is concerned, the findings are presented in Table 4.8 below.

Table 4.8: Importance of the Main Language Skills and Aspects for Future Job/Career

Nº	Main Skills and Aspects	N	Mean	SD	Interpretation
1	Reading and understanding	160	3.54	.73	Very important
2	Writing	156	3.21	.92	Quite important

¹³ Currently, students can easily get access to documentaries in English via You Tube platform, for example.

3	Listening	155	3.41	.83	Quite important
4	Speaking	158	3.60	.72	Very important
5	Scientific/Technical vocabulary	157	3.20	.95	Quite important
6	English grammar	156	3.01	1.04	Quite important
7	Pronunciation	158	3.46	.86	Quite important

As it can be seen from Table 4.8, all the 7 main skills and aspects were presented as important for student's future job. The table indicates that "speaking" was perceived as the most important skill for students' future job (Mean=3.60, SD=.72) and is followed by "reading and understanding" (Mean=3.54, .73). In contrast, although students recognized that grammar is important for their future job/career, it scored the lowest (Mean=3.01, SD =1.04) compared to other main skills and aspects

Students were also asked to choose the main skill or aspect they need the most. The findings for that questions are presented in Figure 4.1 below.

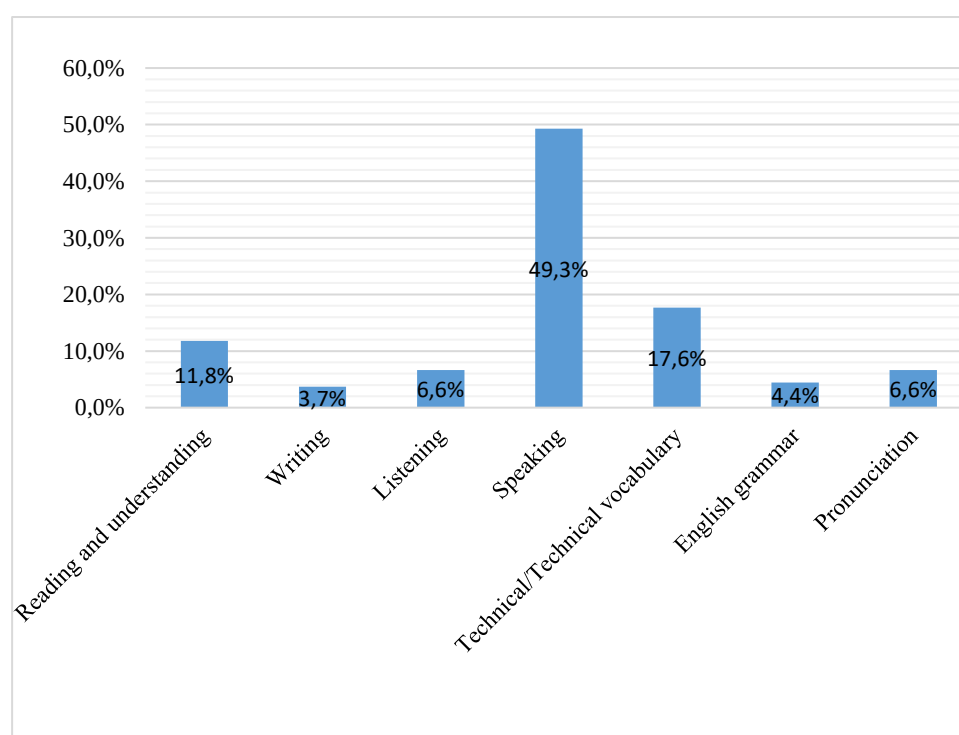


Figure 4.1: The Most Needed Main Skill or Aspect as Perceived by Students

As Figure 4.1 shows, many of the students who responded to the questionnaire perceived "speaking" as the most needed skill.

4.1.2.5.2: Perception of the Importance of Sub-skills and Strategies

As it was done with the main language skills and aspects, the importance of the sub-skills and strategies was measured by means of a four-point scale ranging from “Very important” to “Not important at all”. The sub-skills and strategies belonging to the same main language skill (reading, writing, listening, or speaking) were grouped together. Table 4.9 presents the descriptive statistics of students’ perception of the importance of the sub-skills and strategies grouped according to their types.

Table 4.9: Importance of the Skills and Strategies Grouped according to their Type

Type of Subskills and Strategies	N	Mean	SD	Interpretation
Writing subskills and strategies	166	3.39	.94	Quite important
Listening subskills and strategies	163	3.36	.85	Quite important
Speaking subskills and strategies	166	3.16	.73	Quite important
Reading subskills and strategies	165	3.07	.73	Quite important

As Table 4.9 indicates, all the four types of skills and strategies have overall scores greater than 3.00. These findings reveal that surveyed students recognize the importance of these subskills and strategies.

In order to identify the individual subskills and strategies which are perceived as the most important, the descriptive statistics on the importance of each skill or strategy were computed. Table 4.10 below presents the descriptive statistics of individual speaking subskills and strategies

Table 4.10: Importance of Individual Speaking Subskills and Strategies

N°	Items in the questionnaire	N	Mean	S D	Interpretation
1	Speaking clearly (with correct pronunciation) when talking about your field of study in English	166	3.33	.89	Quite important
2	Speaking accurately (without making mistakes in grammar, vocabulary and pronunciation) when talking about your field of study in English	165	3.19	.92	Quite important
3	Doing a scientific oral presentation in English	163	3.03	.99	Quite important
4	Being able to interpret figures, graphs and charts	163	3.13	.94	Quite important

Table 4.10 above shows that all the speaking subskills have a mean score greater than 3.00. Students therefore recognize that it is important to develop such subskills.

As far as the importance of individual readings subskills and strategies is concerned, Table 4.11 below presents their descriptive statistics.

Table 4.11: Importance of Individual Reading Subskills and Strategies

N°	Item in the Questionnaire	N	Mean	SD	Interpretation
5	Reading quickly to get the general idea of scientific texts (skimming)	164	2.98	.96	Quite important
6	Distinguishing facts from opinions when reading scientific texts	164	2.88	.94	Quite important
7	To identify cause-effect relationships in a scientific text	164	2.90	.94	Quite important
8	Read carefully so as to understand the details of a scientific text	165	3.17	.91	Quite important
9	To guess the meaning of the unknown word from the context	163	2.96	.97	Quite important
10	Reading quickly to find specific information in a scientific text (scanning).	162	2.82	1.07	Quite important
11	Using a dictionary	163	3.21	.97	Quite important
12	Inferring and identifying key information in the scientific text	164	2.96	.93	Quite important
13	Understanding written instructions	163	3.28	.83	Quite important
14	Understanding the main points of a scientific text	163	3.12	.90	Quite important
15	Understanding public notices	162	3.10	.94	Quite important
16	Taking notes from what you read	163	3.06	1.00	Quite important

17	Reading critically scientific texts	164	2.93	1.04	Quite important
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Table 4.11 above shows that students perceive all the reading subskills and strategies as quite important. Of the 12 reading subskills and strategies, 6 obtained a score greater than 3.00. This implies that a considerable number of students perceive these skills as very important; some of these skills are understanding written instructions (Mean= 3.28, SD= .83), using a dictionary (Mean=3.21, SD=.97), understanding the main points of a scientific text and taking notes from what you read. Other subskills and strategies such as skimming, scanning, guessing the meaning of unknown words, scored close to 3.00. They are also acknowledged as important

With regard to the importance of writing subskills and strategies, the findings are presented in Table 4.12 below.

Table 4.12: Importance of Individual Writing Subskills and Strategies

N°	Item in the questionnaire	N	Mean	S D	Interpretation
18	Writing formal/professional letters	164	3.42	.84	Quite important
19	Reporting scientific/ research results	165	3.38	.85	Quite important
20	Writing different types of essays	164	3.27	.84	Quite important
21	Writing a summary	160	3.29	.94	Quite important
22	Synthesizing ideas or information from more than one scientific source	161	3.39	.78	Quite important
23	Filling in an online form for scholarship application	164	3.27	.98	Quite important
24	Describing scientific processes/phenomena	162	3.09	.89	Quite important

Table 4.12 above indicates that all the items scored higher than 3.00. This shows that students who responded to the questionnaire believe that writing subskills and strategies are important. The four skills which scored the highest are (1) writing a professional letter, (2) synthesizing ideas or information from more than one scientific source, (3) reporting scientific/ research results, and (4) Writing a summary

As far as the importance of listening subskills and strategies are concerned, the findings are presented on Table 4.13

Table 4.13: Importance of Individual Listening Subskills and Strategies

N°	Item in the questionnaire	N	Mean	S D	Interpretation
25	Listening to a lecture/lecturer	161	3.35	.87	Quite important
26	Taking notes in lectures, meetings or conferences	162	3.28	.89	Quite important
27	Understanding instructions given orally.	163	3.41	.79	Quite important
28	Guessing the meaning of difficult words from context while listening to scientific texts	162	3.24	.92	Quite important

As it can be seen in the above table, all the listening subskills scored higher than 3.00. This finding indicates that the listening subskills and strategies are perceived by students as very important. The same table shows how students attach great importance to the subskills of understanding instruction given orally (M=3.41) and listening to a lecture (M=3.35).

4.1.2.5.3. Students' Self-evaluation of their Level of Knowledge of Subskills and Strategies

The students' level of knowledge was determined using self-evaluation. On a five-point rating scale (ranging from "Very weak" to "Very good"), students were asked to self-evaluate their level of knowledge of speaking, reading, writing and listening subskills and strategies. Table 4.14 below presents the descriptive statistics for each item of speaking subskills and strategies.

Table 4.14: Self-evaluation of the Knowledge of Speaking Subskills and Strategies

N°	Item in the Questionnaire	N	Min	Max	Mean	SD	Level
1	Speaking clearly (with correct pronunciation) when talking about your field of study in English	170	1.00	5.00	2.85	1.02	Average

2	Speaking accurately (without making mistakes in grammar, vocabulary and pronunciation) when talking about your field of study in English)	172	1.00	5.00	2.80	1.16	Average
3	Making a scientific oral presentation in English	170	1.00	5.00	2.83	1.13	Average
4	Being able to interpret figures, graphs and charts	167	1.00	5.00	2.65	1.22	Average

The Table 4.14. above indicates that all the four reading subskills and strategies have a mean score ranging from 2.65 to 2.85. This means that students evaluated themselves as having an average level of knowledge in these skills. It is notable that none of these subskills and strategies scored greater than 3, meaning that their level of knowledge is not far from weak.

As far as the reading subskills are concerned, the findings are presented in Table 4.15 below.

Table 4.15: Self-evaluation of the Knowledge of Reading Subskills and Strategies

N°	Item in the Questionnaire	N	Min	Max	Mean	SD	Level
5	Reading quickly to get the general idea of scientific texts (skimming)	170	1.00	5.00	2.85	1.06	Average
6	Distinguishing facts from opinions when reading scientific texts	170	1.00	5.00	2.86	1.01	Average
7	To identify cause-effect relationships in a scientific text	171	1.00	5.00	2.84	1.08	Average
8	Read carefully so as to understand the details of a scientific text	169	1.00	5.00	3.35	1.04	Good
9	To guess the meaning of the unknown word from the context	167	1.00	5.00	2.90	1.04	Average
10	Reading quickly to find specific information in the text (scanning).	170	1.00	5.00	2.76	1.14	Average

11	Using a dictionary	166	1.00	5.00	3.77	1.09	Good
12	Inferring and identifying key information in the scientific text	168	1.00	5.00	3.01	.93	Good
13	Understanding written instructions	169	1.00	5.00	3.14	1.02	Good
14	Understanding the main points of a scientific text	170	1.00	5.00	3.22	1.00	Good
15	Understanding public notices	165	1.00	5.00	3.05	.96	Good
16	Taking notes from what you read	166	1.00	5.00	3.19	1.06	Good
17	Reading critically	170	1.00	5.00	2.94	1.01	Average

As indicated in Table 4.15 above, the findings from students' evaluation of their level of knowledge of the reading subskills and strategies revealed that students report to have a good level regarding many of these skills. In fact, students claimed to be good at using a dictionary (Mean=3.77, SD=1.09), at reading for detailed understanding (Mean =3.35, SD=1.04), understanding the main points of a scientific text (Mean=3.22, SD=1.00) and taking notes from what they read. On the other hand, students reported to have an average level in scanning (Mean=2.76, SD=1.14), identifying cause-effect relationships in a scientific text (Mean=3.01, SD=.93) and skimming (Mean 2.85, SD=1.06). It is notable that in none of the reading subskills and strategies did students report to have a very good level of knowledge.

With regard to students' level of knowledge in writing subskills and strategies, the results are presented in Table 4.16 below.

Table 4.16: Self-evaluation of the Knowledge of Writing Subskills and Strategies

N°	Items in the Questionnaire	N	Min	Max	Mean	S D	Level
18	Writing formal/professional letters	171	1.00	5.00	2.73	1.15	Average
19	Reporting scientific/ research results	172	1.00	14.00	2.64	1.45	Average
20	Writing different types of essays	171	1.00	5.00	2.65	1.19	Average
21	Writing a summary	170	1.00	5.00	2.96	1.12	Average

22	Synthesizing ideas or information from more than one scientific source	168	1.00	5.00	2.79	1.10	Average
23	Filling in an online form for scholarship application	169	1.00	5.00	2.70	1.12	Average
24	Describing processes/phenomena	170	1.00	5.00	2.68	.98	Average

The findings presented in Table 4.16 revealed that students have an average level of knowledge in all writing subskills and strategies. The items that scored the lowest are reporting scientific/research results (Mean= 2.64, SD=1.45), writing different types of essays (Mean=2.65, SD=1.19), and describing processes (Mean=2.68, SD=.98). However, all of them scored under 3. This means that students are not far from weak in terms of writing subskills and strategies.

As far as students' level of knowledge of listening subskills and strategies is concerned, the results are presented in Table 4.17 below.

Table 4.17: Self-evaluation of the Knowledge of Listening Subskills and Strategies

N°	Items in the Questionnaire	N	Min	Max	Mean	S D	Level
25	Listening to a lecture/lecturer	165	1.00	5.00	2.96	1.07	Average
26	Taking notes in lectures or meetings or conferences	170	1.00	5.00	2.82	1.04	Average
27	Understanding instructions given orally.	170	1.00	5.00	2.98	1.08	Average
28	Guessing the meaning of difficult words from context while listening to scientific texts	170	1.00	5.00	2.74	1.09	Average

The table indicates that the level of knowledge of listening subskills and strategies is average. Students therefore claimed to have an average level in listening to a lecture, taking notes during lectures or meetings, understanding oral instructions, and guessing the meaning of difficult words from context. Again. All the items scored less than 3.

To get an overall picture of the student's level of knowledge of subskills and strategies, the descriptive statistics for each category were computed as presented in Table 4.18.

Table 18: Students' Level of Knowledge in the Four Categories of subskills and strategies

Category	N	Min	Max	Mean	SD	Level
Speaking subskills and Strategies	172	1.00	5.00	2.79	.95	Average
Reading subskills and strategies	172	1.00	5.00	3.07	.69	Good
Writing Subskills and strategies	173	1.00	5.00	2.74	.86	Average
Listening subskills and Strategies	170	1.00	5.00	2.87	.89	Average

Table 4.18 shows that students confirmed to have an average level in speaking, writing and listening subskills and strategies. On the other hand, they reported to have a good level of knowledge in reading subskills and strategies.

4.1.2.5.4. Students' Preferences and Beliefs in Language Learning

In order to understand what students believe and prefer in terms of strategies, activities, methodology and materials, they were given statements and were asked to say how much they agree or disagree. They were therefore given choices ranging from “Strongly agree” to Strongly Disagree”. The findings are presented in Table 4.19 below:

Table 4.19: Students Beliefs and Preferences

	Item in the Questionnaire	N	Mean	SD	Interpretation
1	I learn/would learn English better if activities are given in groups	172	2.76	1.33	Neutral
2	I learn/would learn English better if activities are given in pairs	171	2.88	1.25	Neutral
3	I don't worry about making mistakes when learning English	168	3.85	1.08	Agree
4	I learn/would learn better if the teacher uses translation when explaining his lectures	172	3.58	1.16	Agree
5	I learn/would learn better if the teacher uses videos and audios from native speakers in the classroom	170	3.05	1.39	Neutral
6	I learn/would learn English better if teachers use visual materials (videos, diagrams, photos, pictures).	169	3.33	1.33	Neutral
7	The best language learning materials are written texts/reading comprehension texts.	170	3.51	1.20	Agree

8	I learn/would learn better if learning activities involve audio materials (listening to lectures, conversations/ songs).	171	3.17	1.28	Neutral
9	I learn/would learn better if the teacher uses scientific texts rather than general English texts	169	3.15	1.37	Neutral
10	I would like to spend much of my time doing activities by myself rather than listening to the English teacher	170	2.39	1.31	Disagree
11	I learn /would learn better when the English teacher gives us the opportunity to practice role-plays and share ideas, opinions and experiences	171	3.92	1.18	Agree
12	I learn/would learn better if teachers incorporate individual, pair, and group work.	170	3.61	1.20	Agree

Table 4.19 above indicates that items 1, 2, 5, 6, 8, 9 obtained mean scores that range between 2.5 and 3.4. This means that students neither agree, nor disagree that they learn/would learn English better if activities are given in groups (Mean=2.76, SD=1.33), they learn/would learn English better if activities are given in pairs (Mean=2.88, SD=1.25) and that they should spend much of their time doing activities by themselves rather than listening to their English teacher (Mean=2.39, SD=1.31), etc. Asked if they would like to spend much of their time doing activities by themselves rather than listening to the English teacher (item 10), the majority of the students disagreed (Mean=2.39; SD=1.31).

On the contrary, all the remaining items obtained mean scores that are greater than 3.5. This indicates that students agreed on these items. For example, they agreed that they should not worry about making mistakes (Mean=3.85, SD=1.08), that they would learn better if they are given the opportunity to practice role-plays and share ideas, opinions and experiences (Mean=3.92, SD=1.18), and that they would learn better if the teacher uses translation when explaining (Mean=3.58, SD=1.16). They also agreed on the use of audio-visual materials and the use of a combination of both individual and group activities.

4.1.2.6. Views on the Strategies to Improve English Knowledge Overall

Students were also asked to give their views on the strategies that would help them to improve their overall English language knowledge. The findings presented on Figure 4.2 show that

almost all the strategies presented on that figure obtained a Yes-answer percentage which is higher than 70%. Therefore, students believe that strategies such as reading any English text that is interesting to them, watching television in English, watching movies in English, listening to native speakers on the radio, revising regularly the English course, doing homework, and visiting web sites that are in English can help them to improve their overall knowledge in the English language.

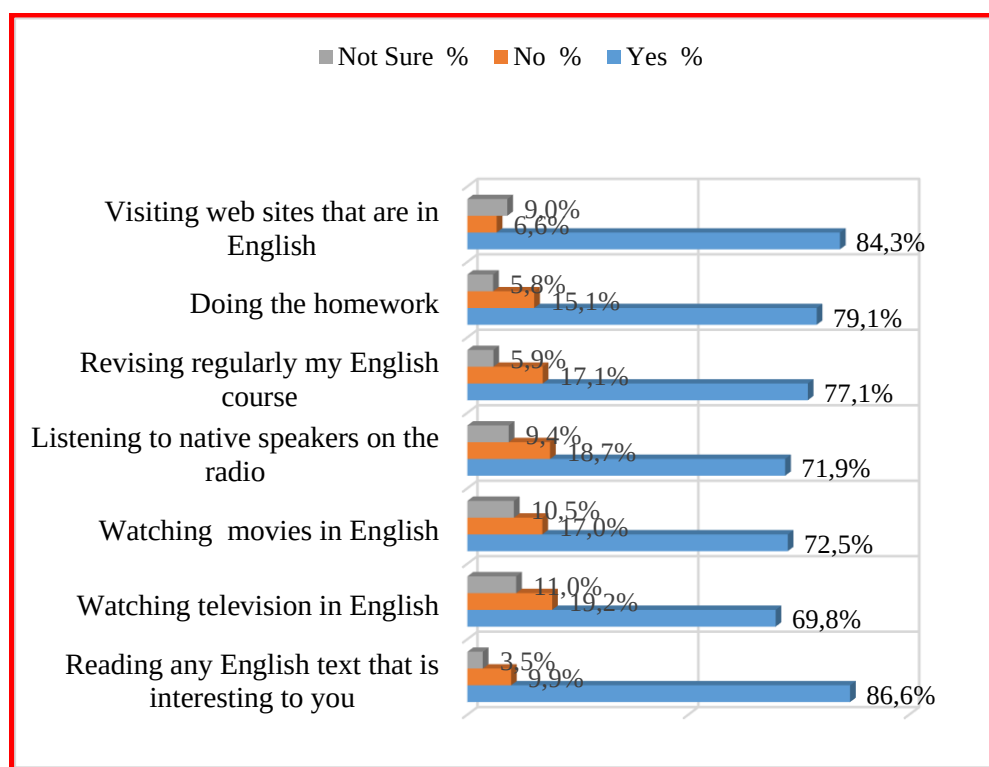


Figure 4.2: Students' Views on the Strategies to Improve overall Knowledge of English Language

4.1.2.7. Student's Evaluation of the English Course Studied at University

In this part of the questionnaire, students were first asked to self-evaluate their level of English before and after they studied the English course at university. They were asked to rate their knowledge on a five-point rating scale ranging from "Very poor" to "Excellent". The Findings are presented in Table 4.20 below:

Table 4.20: Students' Knowledge of English

When	N	Mean	SD	Interpretation
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Before studying the English course	173	2.91	.83	Fair
After studying the English course	173	3.41	.89	Fair

As Table 4.20 revealed, students' knowledge of the English language remained fair before and after studying the English course at university. Although their knowledge remained fair, there has been a small improvement since the mean score shifted from 2.91 to 3.41. But, was this increase due to the English course they took at university? In order to get an answer on this question, the researcher measured students' satisfaction with the English course. They were asked to indicate the extent to which they think the English course (at university) helped them to achieve each of a number of objectives in terms of the main languages skills and aspects. They were given options ranging from "did not help me at all" to "help me to a great extent". The findings are presented in Table 4.21 below:

Table 4.21: How the course helped students to achieve their objectives with regard to the main Language Skills and Aspects

N°	Item in the questionnaire	N	Mean	SD	Interpretation
1	To develop reading comprehension skills and strategies	172	2.60	.91	To some extent
2	To improve writing skills	172	2.56	.97	To some extent
3	To develop the ability to understand spoken English	170	2.74	1.05	To some extent
4	To develop oral expression in general	171	2.65	.99	To some extent
5	To improve the knowledge of grammar	168	2.58	1.05	To some extent
6	To expand knowledge of scientific vocabulary in English	171	2.88	1.00	To some extent
7	To improve your pronunciation in English	170	2.81	.02	To some extent

Table 4.21 indicates that all the objectives scored between 2.50 and 3.00. This means that the English course helped students to achieve these objectives to some extent. The objectives which scored the lowest are: to improve writing skills (Mean=2.56, SD=.97) and to improve the knowledge of grammar (Mean= 2.58, SD=1.05). On the contrary, compared with other objectives, students reported to have, to some extent, expanded their knowledge of scientific vocabulary in English (Mean=2.88, SD=1.00) and improved their pronunciation (Mean=2.81, SD=.02).

4.1.2.7.1. Evaluation of the Method used by the ESP Teachers

This section was intended to investigate whether ESP Teachers still use the traditional method. Students were given statements reflecting the traditional method (except for one statement) and were asked to say how often it occurs in the classroom. Therefore, choices ranged from “never” to “always”. The findings are then presented in Table 4.22 below:

Table 4.22. The Method Used by ESP teachers

N°	Item in the Questionnaire	N	Min	Max	Mean	SD	Frequency Scale
1	Kirundi and French are mainly used throughout the English course	171	1.00	5.00	2.35	1.09	Low
2	English vocabulary is taught in the form of isolated words	169	1.00	5.00	2.44	1.21	Low
3	Much class time is spent on grammar and translation exercises	169	1.00	5.00	2.66	1.23	Medium
4	Reading activities take up a considerable amount of class time, and the main focus is placed on translating English into French or Kirundi	172	1.00	5.00	2.29	1.19	Low
5	Considerable amounts of class time are dedicated to repetitive drills.	171	1.00	5.00	2.57	1.22	Low
6	The teacher just talks and students listen	172	1.00	5.00	2.40	1.47	Low
7	Much focus is put on memorization over other forms of learning	166	1.00	5.00	2.92	1.33	Medium
8	The teacher gives an opportunity to students to actively participate in the classroom by giving activities that involve role-plays, paired discussion and group discussion	166	1.00	5.00	3.60	1.30	High

As indicated in Table 4.22, the items 1, 2, 4, 6 have a mean score which is smaller than 2.5. This means that ESP teachers do not generally use translation into Kirundi and French while teaching; nor do they generally teach vocabulary in the form of isolated words. On the contrary, items 3, 5, 6 have mean scores which are between 2.5 and 3.4. This means ESP teachers sometimes spend time on grammar and memorising or repetitive drills. However, since the item 8 has a mean score greater than 3.5, students believe that ESP teachers usually use

activities involving role-plays, paired discussion and group discussion in order to help students get an opportunity to actively participate in the classroom (Mean =3.6, SD=1.30).

4.1.2.7.1 Satisfaction with the ESP Course in General

In this section, the researcher examined students' satisfaction with the ESP course in terms of content, materials, time, effect etc. Students were given a number of statements and were asked to indicate the extent to which they agree or disagree. Therefore, the choices ranged from "Strongly disagree" to "Strongly Agree". The results are presented in Table 4.23 below:

Table 4.23: Students' Satisfaction with the ESP Course in General

N°	Item in the Questionnaire	N	Mean	SD	Interpretation
1	The content of the course reflects real life use of English in scientific context	168	3.15	1.26	Neutral
2	The materials used in the English course are very appropriate and cover many topics which reflect real-life situation in scientific context	169	2.97	1.25	Neutral
3	The English teacher gives us tasks and activities that reflect real-life situations	169	3.40	1.23	Neutral
4	Test/ assignment that are given reflect target real life situations.	168	3.28	1.18	Neutral
5	Thanks to the English course, I can now independently read scientific texts	164	3.44	1.21	Neutral
6	The English course helped me to get access to specific bibliography related to my domain.	169	3.10	1.23	Neutral
7	The English course is relevant to my targeted career	168	2.93	1.30	Neutral
8	In the English course, the teachers use texts that are related to (reflect) my field of study and therefore motivating	170	3.63	1.24	Agree
9	The time allocated to the English course is sufficient enough for you to develop necessary skills in English	170	2.18	1.22	Disagree
10	The teachers use recorded native English speakers voices to help us improve our listening	169	2.65	1.27	Neutral
11	The course is appropriate to my level in English	169	3.03	1.26	Neutral

12	The teacher uses videos and audios from native speakers in the classroom	168	2.27	1.26	Disagree
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In the above table, the items 1,2,3,4,7,11 were intended to examine whether the ESP contents, materials and activities are authentic. The mean scores range between 2.5 and 3.4. This means that students are fairly satisfied with the contents, the materials and the activities. However, they agreed that ESP teachers use texts that are motivating (item 8, Mean= 3.61). Items 5 and 6 were intended to evaluate the effect of the English course on students' capacity to independently read scientific texts. Their mean scores (respectively 3.10, 2.93) revealed that students are fairly satisfied.

As far as the use of audio-visual materials is concerned (items 10 and 12), the findings reveal that students are slightly satisfied (their mean score taken together). The item 9 was intended to investigate whether students are satisfied with the time allocated to the course. This item scores the lowest (Mean= 2.18, SD=1.22). This indicates that students are not satisfied with the time allocated to the course. They reported that the time allocated to the English course is not sufficient for them to develop necessary skills in English.

4.1.3. Analysis of Data from Subject Specialist Teacher Questionnaire

The subject specialist teachers (SST) who participated in this study are those who teach in Natural Science departments at UB and BHIE. Their teaching experience ranged from 1 to 33 years and 50% of them reported that English was used as a medium of instruction in their under- or post-graduate studies. Table 4.24 provides more details about the subject specialist teachers that responded to the questionnaire.

Table 4.24: More Details about Subject Specialist Teachers Who Responded to the Questionnaire

			Institution		Total
			UB	BHIE	
Field of Study	Maths	Count	4	4	8
		% within Institution	26.7%	25%	25.8%
	Physics	Count	2	1	3
		% within Institution	13.3%	6.3%	9.7%
	Chemistry	Count	5	0	5
		% within Institution			

	% within Institution	33.3%	0%	16.1%
Biology	Count	2	1	3
	% within Institution	13.3%	6.3%	9.7%
Bio-Chemistry	Count	0	1	1
	% within Institution	0%	6.3%	3.2%
Earth Science (Geology)	Count	1	0	1
	% within Institution	6.7%	0.0%	3.2%
Geography	Count	0	4	4
	% within Institution	0%	25%	12.9%
No answer	Count	1	5	6
	% within Institution	6.7%	31.3%	19.4%
Total	Count	15	16	31
	% within Institution	100%	100%	100%

4.1.3.1. Subject Specialist Teachers' Attitudes towards Learning English Language

As it was the case with students, subject specialist teachers were given a number of statements to agree or disagree on. All the statements were similar to those that were given to students. SST were also given 5 choices ranging from "Strongly disagree" to "Strongly agree". The findings are presented in Table 4.25 below:

Table 4.25: Subject Specialist Teachers' Attitudes towards Learning English Language

N°	Item in the Questionnaire	N	Mean	SD	Interpretation
1	People who are good at natural sciences (ex: Maths, Physics, Chemistry and Biology) are not good at learning English	31	4.52	.77	Positive
2	Science students should attend English classes just to avoid absences.	30	4.53	.86	Positive
3	Students should attend English classes just to get a good mark in the exam	31	4.39	.92	Positive

4	In my opinion, English is a very difficult language and is therefore complicated to learn for science students	31	4.45	.77	Positive
5	I believe English is the language of Arts students, not Science students	31	4.68	.60	Positive
6	English teachers should regret the time they spend when teaching English in departments other than that of English	31	4.61	.67	Positive
7	In Science departments, the English course should be optional rather than compulsory.	29	4.28	1.13	Positive
Overall Mean score		31	4.49	.54	Positive

The findings presented in Table 4.25 above show that the overall mean score is 4.49 (SD=.54). This indicates that subject specialist teachers in Natural Science departments have overall a positive attitude towards learning the English language. The same table reveals that all the statements have a mean score greater than 4.2. This implies that their attitudes towards learning English are very positive

4.1.3.2. Subject Specialist Teachers' Awareness of the Status of English Language Worldwide

In order to examine subject specialist teachers' awareness of the status of the English language, they were given statements similar to those that were given to students. It is worth reminding that those statements were adopted from Graddol's (2000) "Future of English" published by the British Council. Like students, the subject specialist teachers were given three choices to respond by (Yes, NO, Not Sure). The results are presented in Table 4.26 below:

Table 4.26: Subject Specialist Teachers' Awareness of the Status of English Language Worldwide

N°	Item in the questionnaire	Yes	No	Not Sure	Total
		%	%	%	%
1	English is an international language of science and research.	93.5	.0	6.5	100

2	There is an increase in the use of English as a medium of instruction worldwide especially in tertiary education.	77.4	3.2	19.4	100
3	English is closely associated with leading-edge technology.	87.1	3.2	9.7	100
4	English is the working language of international organizations and conferences.	90.3	.0	9.7	100
5	English is the working language of international banking, economic affairs and trade.	64.5	6.5	29.0	100
6	English is the global language of internet/electronic communication	71.0	12.9	16.1	100
7	English is the working language of international law.	40.0	6.7	53.3	100
8	English is the language of international tourism.	58.1	9.7	32.3	100
9	English is a global lingua franca, that is, a language used for communication between people whose native languages are different from one another.	38.7	35.5	25.8	100
10	English is the number one international language of publishing.	90.3	3.2	6.5	100
Average		71.1	8.1	20.8	100

The findings in Table 4.26 above show that the average percentage for Yes-answers is 71.1%. This implies that subject specialist teachers are very much aware of the status the English language enjoys worldwide. Indeed, a large majority of subject specialists reported to be aware that English is an international language of science and research (93.5 %) and that it is the number one international language of scientific publications (90.3%)

4.1.3.3. Reasons for Learning English at University

In terms of subject specialist teachers' perceptions of the reasons for learning English, the findings are presented in Table 4. 27 below.

Table 4.27: Subject Specialist Teachers' Perception of the reasons for learning English.

N°	Item in the Questionnaire	Yes	Not		Total
		%	No %	Sure %	
1	To get access to academic and scientific sources (books) published in English.	100	.0	.0	100
2	Because they may continue their studies abroad at English medium universities	87.1	3.2	9.7	100
3	To increase the chance to get a scholarship to study abroad.	61.3	16.1	22.6	100
4	Because English is a global language of science	67.7	9.7	22.6	100
5	Because English will give them more job opportunities in the East African Community (EAC) and elsewhere	80.6	6.5	12.9	100
6	Because English will help them to work in international companies	83.9	9.7	6.5	100
7	Because English is a gateway to the world of science, commerce and culture	80.6	3.2	16.1	100
8	Because English is the most spoken second language in the world	74.2	9.7	16.1	100
9	Because they will need to discuss with foreign specialists in their domains	71.0	6.5	22.6	100
10	Because they may need, in the future, to publish in English	80.6	6.5	12.9	100
11	Because they will need English to travel abroad	73.3	13.3	13.3	100
12	Because they just need it to obtain their university degree	3.2	74.2	22.6	100

13	Because if they learn English they will become better educated	23.3	46.7	30.0	100
Average		68.22	15.79	15.99	1000

As indicated in Table 4.27 above, 12 out of 13 reasons obtained a Yes-answer percentage that is greater than 60%. This indicates that subject specialist teachers accepted them as reasons for Natural Science students to learn the English language. Indeed, all the teachers (100%) who responded to the questionnaire supported that Natural Science students should learn English to get access to (understand) academic and scientific sources published in English. On the contrary, they disagree that science students study/should study English because they just need it to obtain their university degree (74.2% answered by No to that item).

4.1.3.4. Analysis of the Target Situations (Current/Future Situations)

In this section, teachers were given a number of target situations (current or projected) and were asked to respond by “Yes” or “No”. The findings are presented in Table 4.28 and are put in the descending order based on the Yes-answer percentage.

Table 4.28: Target Situations as Perceived by Subject Specialist Teachers

	N°	Item in the questionnaire	Yes	No	Total
			%	%	%
Current situations	1	To read the handouts/notes/syllabi that are given in English	96.8	3.2	100
	2	To listen to scientific documentaries in English	93.1	6.9	100
	3	To search for internet resources	90.0	10.0	100
	4	To read science textbooks that are in the library	87.1	12.9	100
	5	To interact with English speaking foreigners	80.6	19.4	100
Future	1	To understand documents related to their speciality	100	0.0	100

2	To attend conferences in English	96.8	3.2	100
3	For work in the East African Community	87.1	12.9	100
4	To travel to an English-speaking country	87.1	12.9	100
5	To complete forms and official documents in English	83.9	16.1	100
6	For work in a multinational company or institution	83.3	16.7	100
7	To continue their studies (master and/or doctorate)	80.6	19.4	100
8	To do a job interview in English	80.6	19.4	100
9	To make online applications for scholarship to study abroad	77.4	22.6	100
10	To travel abroad	58.1	41.9	100

As far as the current situations are concerned, Table 4.28 indicates that all the five items obtained a Yes-answer percentage greater than 80%. This indicates that a vast majority of subject specialist teachers believe that students currently (need to) use English in situations like reading the handouts/notes/syllabi that are given in English (96.8%), listening to scientific documentaries in English (93.1%), searching for internet resources (90%) etc.

Regarding the future situations, Table 4.28 above shows that a large majority of the subject specialist teachers confirmed that Natural Science students will (need to) use English to understand documents related to their domains (100%) and to attend conferences in English (96.8%). Other situations such as working in the East African Community, travelling to an English-speaking country, completing forms and official documents in English, working in a multinational company or institution, continuing studies (master and/or doctorate), and doing a job interview in English were supported by more than 80% of the teachers. The same teachers confirmed that students will (need to) use English while making online applications for scholarship to study abroad (77.4%).

4.1.3.5. Subject Specialist Teachers' Perception of the Language Needs

In this section of the questionnaire, the intention was to understand subject specialist teachers' perceptions of (1) the importance of the main language skills and aspects for their studies and for their prospective job, (2) the importance of subskills and strategies. As it was the case with the students' questionnaire, the importance was measured on a four-point Likert scale ranging from "Very important" to "Not important at all"

4.1.3.5.1. Teachers' Perception of the Importance of the Main Language Skills for Students' Studies

As far as the subject specialist teachers' perception of main language skills is concerned, the results are displayed in Table 4.29 below.

Table 4.29: Teachers' Perception of the Importance of the Main Language Skills and Aspects for Students' Studies

N°	Item in the Questionnaire	N	Mean	SD	Interpretation
1	Reading and understanding	30	3.80	.55	Very important
2	Writing	30	3.80	.55	Very important
3	Listening	30	3.70	.65	Very important
4	Speaking	29	3.72	.59	Very important
5	Scientific (technical) terms	30	3.67	.66	Very important
6	English grammar	30	3.47	.73	Quite important
7	Pronunciation	30	3.40	.72	Quite important

As Table 4.29 above shows, subject specialist teachers perceived all the four main language skills (reading, writing, listening and speaking) as very important for Natural Science students' studies. Similarly, the language aspect of scientific or technical terms was perceived as very important. However, aspects of grammar and pronunciation were perceived as quite important.

4.1.3.5.2. Importance of the Main Language Skills and Aspects for Students' Future Career

The table 4.30 below displays the subject specialist teachers' perception of the importance of the main language skills and aspects for students' future job occupation.

Table 4.30: Teachers' Perception of the Importance of the Main Language Skills and Aspects for Students' Future Career

N°	Item in the Questionnaire	N	Mean	SD	Interpretation
1	Reading and understanding	29	3.45	.69	Quite important
2	Writing	29	3.62	.68	Very important
3	Listening	28	3.54	.74	Very important
4	Speaking	28	3.61	.69	Very important
5	Scientific (technical) terms	28	3.57	.79	Very important
6	English grammar	28	3.14	.85	Quite important
7	Pronunciation	28	3.21	.88	Quite important

The findings presented in Table 4.30 above revealed that subject specialist teachers perceived writing, listening, speaking and scientific terms as very important for students' future career. On the other hand, reading, grammar and pronunciation are perceived as quite important.

Like students, subject specialist teachers were also asked to indicate the main language skill or aspect that they think students need the most. The findings for that question are presented on the Figure 4.3 below:

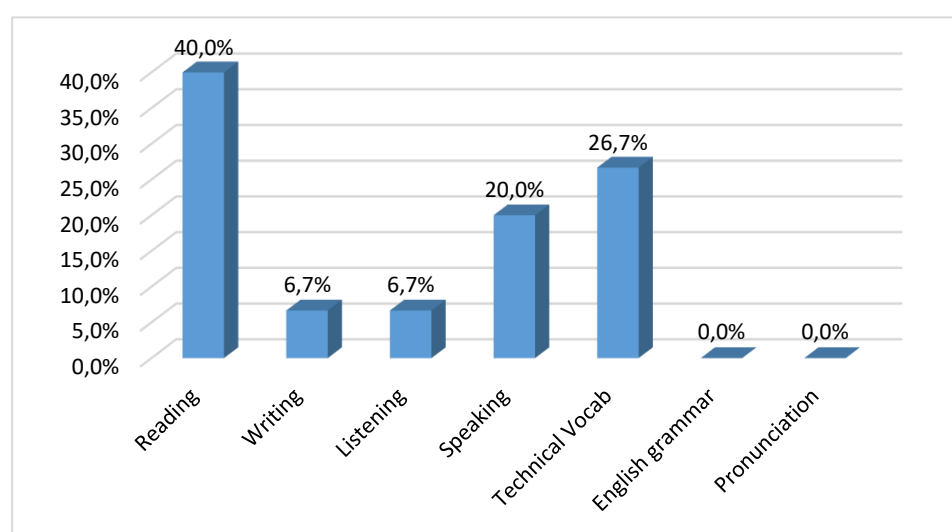


Figure 4.3: The Most Needed Main Skill or Aspect as Perceived by Subject Specialist Teachers

According to subject specialist teachers (see Figure 4.3), reading is the main language skill that natural science students need the most (40%). It is followed by scientific/technical vocabulary (26, 7%) and speaking (20%).

4.1.3.5.3. Teachers' Perception of the Importance of Sub-skills and Strategies

The skills and strategies were first grouped together according to their type and the results are presented in Table 4.31.

Table 4.31 Teachers' Perceptions of the Importance of Skills and Strategies Grouped According to their Type

Types of subskills and strategies	N	Mean	SD	Interpretation
Speaking subskills and strategies	31	3.60	.34	Very important
Reading subskills and strategies	31	3.42	.45	Quite important
Writing subskills and strategies	31	3.58	.46	Very important
Listening subskills and strategies	31	3.59	.48	Very important

The above table shows that except for the reading skills and strategies that were perceived by teachers as being quite important. All the other 3 types of skill (speaking, writing and listening) were believed to be very important for students.

As far the importance of individual speaking subskills and strategies is concerned, the findings are displayed in Table 4.32.

Table 4.32: Importance of Individual Speaking Subskills and Strategies as Perceived by Teachers

N°	Item in the questionnaire	N	Mean	SD	Interpretation
1	Speaking clearly when talking about their field of study in English	31	3.74	.63	Very important
2	Speaking accurately (without making mistakes in grammar, vocabulary and pronunciation) when talking about their field of study in English	30	3.20	.71	Quite important

3	Making a scientific oral presentation in English	31	3.97	.18	Very important
4	Being able to interpret figures, graphs and charts?	31	3.48	.81	Quite important

Table 4.32 above indicates that ‘Making a scientific oral presentation in English’ scored the highest (Mean=3.97, SD=.18. This means that this speaking subskill is perceived by subject teachers as very important for students. Another important speaking subskill that teachers perceive as very important as is speaking clearly.

In terms of the importance of individual reading subskills and strategies, the findings are presented in Table 4.33. below.

Table 4.33: Importance of Individual Reading Subskills and Strategies as Perceived by Teachers

N°	Item in the questionnaire	N	Mean	SD	Interpretation
5	Reading quickly to get the general idea of scientific texts (skimming)	29	3.69	.54	Very important
6	Distinguishing facts from opinions when reading scientific texts	31	3.61	.56	Very important
7	To identify cause-effect relationships in a scientific text	31	3.39	.72	Quite important
8	Read carefully so as to understand the details of a scientific text	30	3.63	.56	Very important
9	To guess the meaning of the unknown word from the context	30	3.43	.82	Quite important
10	Reading quickly to find specific information in a scientific text (scanning)	30	3.37	.72	Quite important
11	Using a dictionary	31	2.81	1.11	Quite important

12	Inferring and identifying key information in a scientific text	30	3.40	.86	Quite important
13	Understanding written instructions	31	3.45	.81	Quite important
14	Understanding the main points of a scientific text	30	3.37	1.00	Quite important
15	Understanding public notices	29	3.45	.74	Quite important
16	Taking notes from what you read	30	3.10	.92	Quite important
17	Reading critically scientific texts	31	3.77	.43	Very important

Table 4.33 shows that subject specialist teachers recognize all the presented reading subskills and strategies as important for students. The subskills and strategies regarded as very important are: reading critically scientific texts (mean=3.7, SD=.43), reading quickly to get the general idea of scientific texts [skimming] (Mean=3.69, SD=.54), reading carefully so as to understand the details of a scientific text (Mean=3.63, SD=.56) and distinguishing facts from opinions when reading scientific texts (Mean=3.61, SD= .56).

As far as subject specialist teachers' perception of the importance of individual writing subskills and strategies is concerned, the results are presented in Table 4.34.

Table 4.34: Importance of Individual Writing Subskills and Strategies as Perceived by Subject Specialist Teachers

N°	Item in the questionnaire	N	Mean	SD	Interpretation
18	Writing formal/professional letters	30	3.43	.82	Quite important
19	Reporting scientific/ research results	30	3.63	.72	Very important
20	Writing different types of essays	30	3.53	.73	Very important
21	Writing a summary	29	3.66	.61	Very important
22	Synthesizing ideas or information from more than one scientific source	30	3.63	.67	Very important
23	Filling in an online form for scholarship application	31	3.58	.56	Very important
24	Describing scientific processes/phenomena	31	3.61	.62	Very important

Table 4.34 above indicates that all the writing subskills and strategies (with the exception of item 18) are regarded as being very important for students. The two subskills that score the highest are writing a summary (Mean=3.66, SD=.61) and synthesizing ideas or information from more than one scientific source (Mean=3.63, SD=.67)

With regard to listening subskills and strategies, the findings are displayed in Table 4.35.

Table 4.35: Importance of Individual Listening Subskills and Strategies as Perceived by Teachers

N°	Item in the Questionnaire	N	Mean	SD	Interpretation
1	Listening to a lecture/lecturer	31	3.81	.54	Very important
2	Taking notes in lectures, meetings or conferences	31	3.68	.60	Very important
3	Understanding instructions given orally.	31	3.55	.68	Very important
4	Guessing the meaning of difficult words from context while listening to scientific texts	30	3.30	.84	Quite important

As indicated in Table 4.35, subject specialist teachers consider as very important the listening subskills like listening to a lecture/lecturer (Mean=3.81, SD=.54), taking notes in lectures or meetings, understanding oral instructions. It is notable that guessing the meaning of difficult words is acknowledged as important.

4.1.3.6. Teachers' Beliefs and Preferences in Language Learning

Like in students' questionnaire, this section was intended to understand teachers' beliefs and preferences in terms of strategies, activities, methodology and materials. They were given statements and were asked to say how much they agree or disagree. Choices ranged from "Strongly agree" to Strongly Disagree". The results are presented in Table 4.36 below:

Table 4.36: Teachers' Beliefs and Preferences in Language Learning

N°	Item in the Questionnaire	N	Mean	SD	Interpretation
1	Students learn/would learn better if activities are given in groups	31	3.32	1.22	Neutral

2	Students learn/would learn better if activities are given in pairs	31	3.48	1.12	Neutral
3	Students should not worry about making mistakes when learning English	31	4.03	1.45	Agree
4	Students learn/would learn better if the teacher uses translation when explaining	30	2.33	1.12	Disagree
5	Students learn/would learn better if the teacher use videos and audios from native speakers in the classroom	31	3.77	1.26	Neutral
6	Students learn/would learn English better if teachers use visual materials (videos, diagrams, photos, pictures).	30	4.03	1.10	Agree
7	The best language learning materials are written texts/reading comprehension texts.	30	3.57	1.01	Agree
8	Students learn/would learn better if learning activities involve audio materials (listening to lectures, conversations/ songs).	31	3.87	1.23	Agree
9	Students learn/would learn better if the teacher uses scientific texts rather than general English texts.	31	3.97	1.17	Agree
10	Students learn/would learn better if they spend much of their time doing activities by themselves rather than listening to the teacher	31	3.19	1.35	Neutral
11	Students learn /would learn better if the teacher gives them opportunity to practice role-plays and share ideas, opinions and experiences	31	4.45	.93	Agree
12	Students learn/would learn if teacher incorporates individual, pair, and group work	31	4.29	1.07	Agree

The data in Table 4.36 above show that item 11 scored the highest. This means that a considerable number of subject specialist teachers strongly believe that students would learn

better if they are given opportunity to practice role-plays and share ideas and experiences (Mean=4.45, SD=.93). Similarly, they believe that the use of visual materials, scientific texts, and audio materials would help students learn better. On the contrary, teachers are neutral on whether classroom activities should be given in groups, or in pairs. Similarly, they neither agree, nor disagree that students should spend much of their time doing activities by themselves rather than listening to the teacher.

4.1.3.7. Subject Specialist Teachers' Views on the Strategies to Improve English Knowledge Overall

Subject specialist teachers were also asked to provide their views on the strategies that would help students to improve their knowledge of English overall. The findings are presented on Figure 4.4 below.

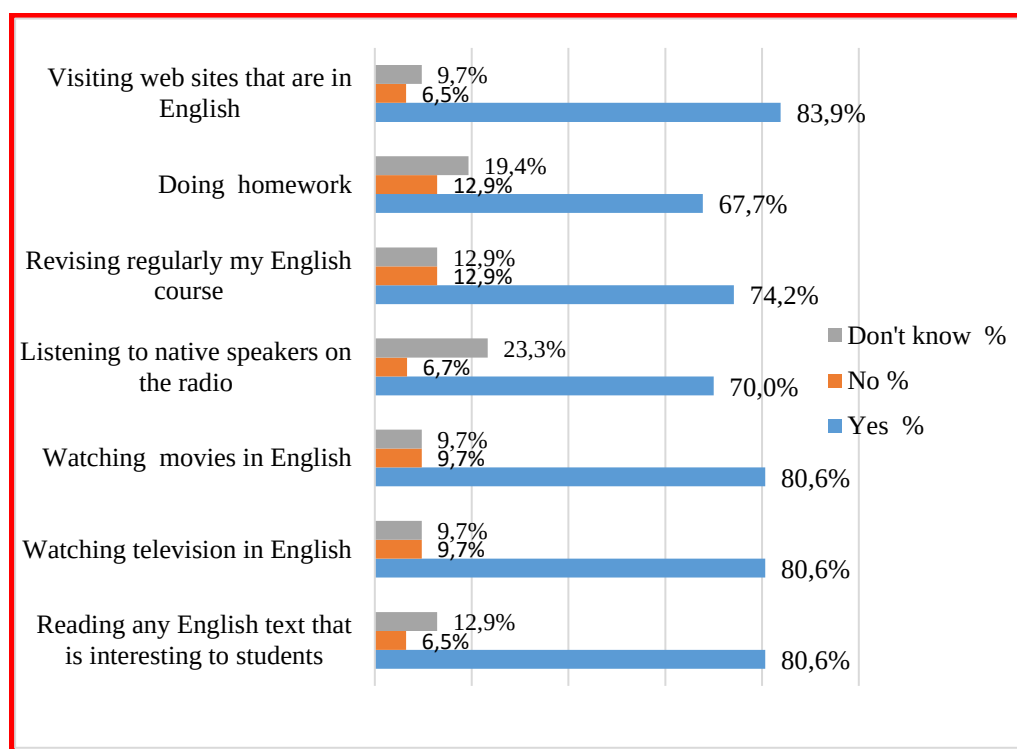


Figure 4.4: Teachers' Views on the Strategies to Improve overall Knowledge of English Language

As indicated on Figure 4.4, subject specialist teachers reported that all the 7 strategies can help students improve their overall knowledge in English. Strategies such as visiting websites that are in English, watching television in English, watching movies in English, and reading any English text that is interesting obtained a Yes-response percentage that is higher than 80%; this

means that the majority of teachers view these strategies as very helpful to students. The strategy that was ranked the first is visiting web sites that are in English (yes-response of 83.9%).

4.1.3.8. Analysis of Final Questions in Subject Specialist Teacher Questionnaire

In the final part of the questionnaire, teachers were asked whether they give to their students notes/handouts that are in English. The results are presented on Figure 4.5.

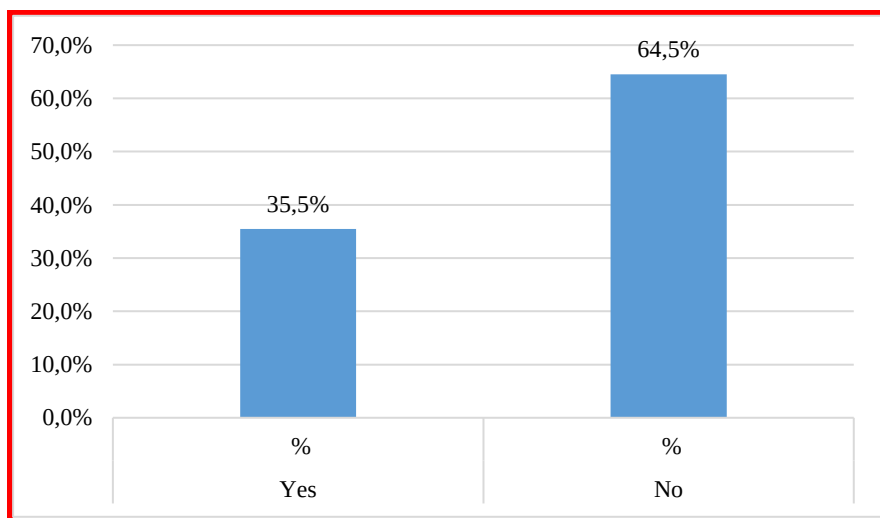


Figure 4.5: Teachers' Response on whether they Give Notes/Syllabi in English

The findings on Figure 4.5 above show that the majority of teachers (64.5%) reported that they do not give notes/handouts that are in English. Only 35% of the respondents confirmed that they do give notes in English, a figure which is in fact not negligible.

The second question asked in the final part of subject specialist teacher questionnaire was about whether they would recommend students to read science books written in English. The results are presented on Figure 4.6.

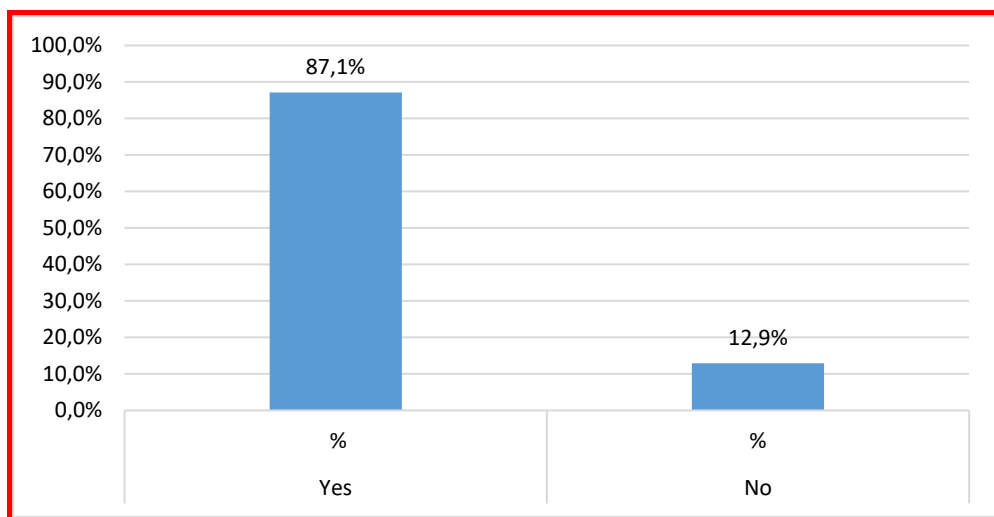


Figure 4. 6: Teachers’ Response on Whether they Would Recommend Students to Read Books in English

As the above figure shows, a large majority of teachers (87.1%) accepted that they would recommend students to read science books that are in English.

Since in Natural Science departments, the time allocated to the English course is 30h in First and 30h in second years, subject specialist teachers were also asked to say whether such time is sufficient for students to develop necessary skills in order to meet their English language needs. The findings are displayed on Figure 4.7 below.

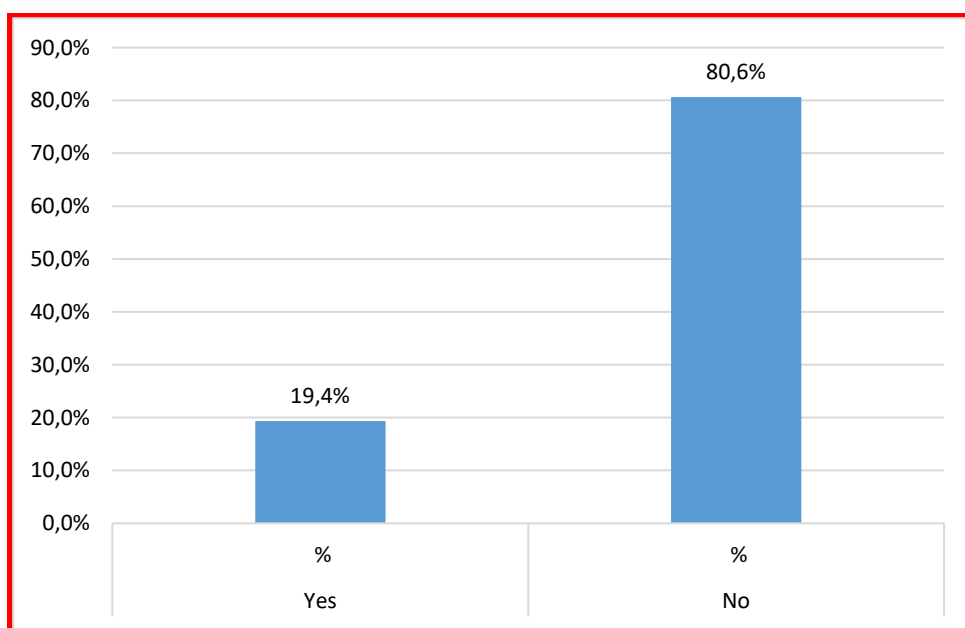


Figure 4.7: Responses on Whether the Time Allocated to the English Course is Sufficient

The Figure 4.7 above indicates that subject specialist teachers highly acknowledged that the time allocated to the English course is not enough for students to develop necessary skills in English.

As far as the last question in the subject specialist teachers' questionnaire is concerned, teachers were asked to provide their recommendations for promoting the teaching/learning of the English language in their departments. Their major recommendations are summarized in Table 4.37

Table 4.37: Subject Specialist Teachers' Recommendations for Promoting the English Language

- | |
|---|
| <ul style="list-style-type: none"> ▪ Instituting the English course at all levels of undergraduate studies ▪ Giving to students handouts that are in English ▪ Suggesting English references to students ▪ Increasing the time allocated to the English course and practical activities ▪ Teaching some science courses in English ▪ Instituting and supporting English clubs in science departments ▪ Designing substantial ESP courses for science students ▪ Encouraging students to learn English not only for mark [even after the course has ended] |
|---|

4.1.4. Analysis of Policymaker Questionnaire

Unlike the students' and the subject specialist teachers' questionnaires, the questionnaire for policymakers was administered online and was hence shortened to avoid potential boredom on the part of the respondents. The questionnaire for policymakers collected information mainly about their awareness of the status of the English language worldwide (part 1) and their perception of the reasons for learning English in science departments. It also included some final questions specific to policymakers.

4.1.4.1. Policymakers' Awareness of the Status of English Language Worldwide

As said above, the first part of the policymakers' questionnaire collected information about their awareness of the status of English language worldwide. The findings for this part are presented in Table 4.38 below. They are presented in the descending order of Yes-Answer percentage.

Table 4.38: Policymakers' Awareness of the Status of English Language Worldwide

N°	Item in the Questionnaire	Yes	No	Not sure	Total
		%	%	%	%
1	English is an international language of science and research.	100.0	0.0	0.0	100
2	English is closely associated with leading-edge technology.	90.0	10.0	0.0	100
3	English is the working language of international organizations and conferences.	90.0	10.0	0.0	100
4	English is the number one international language of publishing.	90.0	10.0	0.0	100,0
5	There is an increase in the use of English as a medium of instruction worldwide especially in tertiary education.	80.0	0.0	20.0	100
6	English is the global language of internet/electronic communication	80.0	0.0	20.0	100
7	English is a global lingua franca, that is, a language used for communication between people whose native languages are different from one another.	80.0	0.0	20.0	100
8	English is the working language of international banking, economic affairs and trade.	70.0	20.0	10.0	100
9	English is the language of international tourism.	60.0	20.0	20.0	100
10	English is the working language of international law.	10.0	20.0	70.0	100
Average		75.0	9.0	16.0	100

Table 4.38 above indicates that the average percentage for Yes-Answers is 75 %. This percentage implies that policymakers are very much aware of the status the English language

has worldwide. The item “English is an international language of science and research” obtained the highest Yes- Answers percentage (100%), indicating that policymakers are fully aware of the privileged status the English language enjoys in the domains of science and research. On the contrary, they are still not sure that English is the most widely used language of international law. This item (10) obtained a Yes-Answer percentage of 10% and “Not sure” percentage of 70%.

4.1.4.2. Reasons for Learning English at University

Like students and subject specialist teachers, policymakers were also asked to express their views on the reasons for which science students learn/should learn the English language. The results are presented below in Table 4.39 in the descending order of Yes-Answer percentage.

Table 4.39: Policymakers’ Perception of the Reasons for Learning English

N°	At university, science students learn/should English...	Yes	No	Not Sure	Total
		%	%	%	%
1	To get access to academic and scientific sources (books) published in English.	100	0	0	100
2	Because they may continue their studies abroad at English medium universities	90	0	10	100
3	Because English is a global language of science	90	0	10	100
4	Because English will give them more job opportunities in the East African Community (EAC) and elsewhere	90	0	10	100
5	Because English will help them to work in international companies	90	10	0	100
6	Because English is a gateway to the world of science, commerce and culture	90	0	10	100
7	Because English is the most spoken second language in the world	90	10	0	100
8	Because they will need to discuss with foreign specialists in their domains	90	10	0	100
9	Because they may need, in the future, to publish in English	80	0	20	100

10	Because they will need English to travel abroad	80	20	0	100
11	To increase the chance to get a scholarship to study abroad.	60	20	20	100
12	Because if they learn English they will become better educated	30	40	30	100
13	Because they just need it to obtain their university degree	0	60	40	100
Average		75.4	13.1	11.5	100

Table 4.39 shows that 10 out of 13 items obtained a Yes-Answer percentage that is higher than or equal to 80 %. This means that policymakers largely accept them as reasons for learning English. For example, all the policymakers who participated in this study believe that Science students learn/should learn the English language to get access to academic and scientific sources (books) published in English. And 90% of them believe it is because English is a global language of science and because English will provide them with more job opportunities in the East African Community (EAC) and elsewhere. Policymakers also acknowledge that science students do not need English just to obtain their university degree. This item (13) received a Yes- Answer percentage of 0%, implying that student's motivation to learn English should go far beyond getting good marks in the English course. Their opinion on the statement (reason) that "if student learn English they will become better educated" is diverse. If fact, each of the three response categories (Yes, No, not sure) on that item obtained a Yes-Answer percentage which is near to that of the others.

4.1.4.3. Analysis of Final Questions in Policymakers' Questionnaire

The final part of the policymakers' questionnaire consisted of four questions. The findings for these questions are presented using figures. The first question was intended to know about policymaker's perception on the time allocated to the English course in natural science departments. They were asked to say whether or not that time is sufficient for students to develop necessary skills in English. The results for this question are presented on Figure 4.8 below.

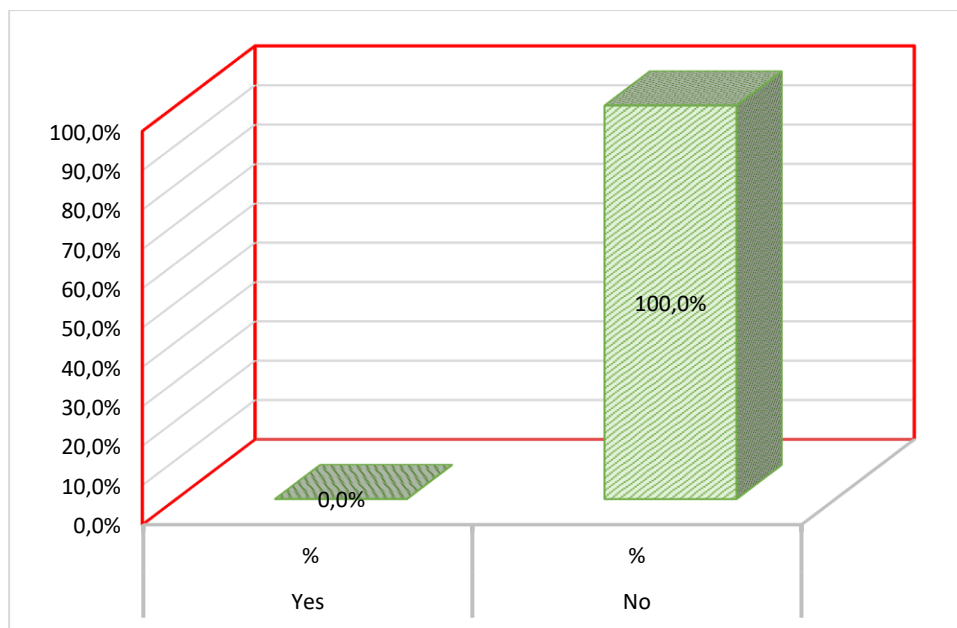


Figure 4.8: Policymakers 'Responses on whether the Time Allocated to the English Course is Sufficient or not

As Figure 4.8 indicates, all the policymakers (100%) who responded to the questionnaire admitted that the time reserved for the English course in Science departments is not enough. It is worth recalling that in Science departments, the English course is given 30h in the first year and 30h in the second year adding up to 60h at the undergraduate level.

The second question in the final part of the questionnaire investigated policymakers 'opinion on whether the English course should be taught at all levels of undergraduate studies, that is, in first, second and third years. The finding for this question is displayed on Figure 4.9 below.

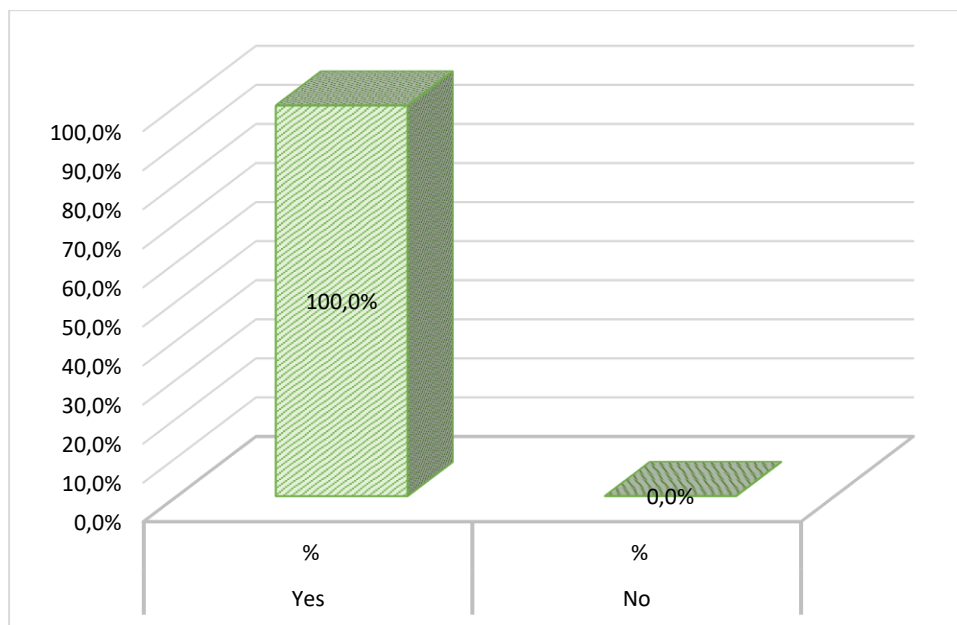


Figure 4.9: Policymakers 'Responses on Teaching the English Course at all Levels of Undergraduate Studies

Figure 4.9 above reveals that all the policymakers (100%) acknowledge the need to initiate the English course at all levels of undergraduate studies in science departments. This finding is consistent with that of the preceding question in which the respondents reported that the time for the English course is not sufficient. Initiating the course in the third year would be an alternative solution.

The third question of the final part was intended to examine policymakers' views on whether, Science teachers (who can teach in English) should be allowed to teach their science courses in English so as to help students immerse themselves in learning English. The findings for that question are presented on Figure 4.10 below.

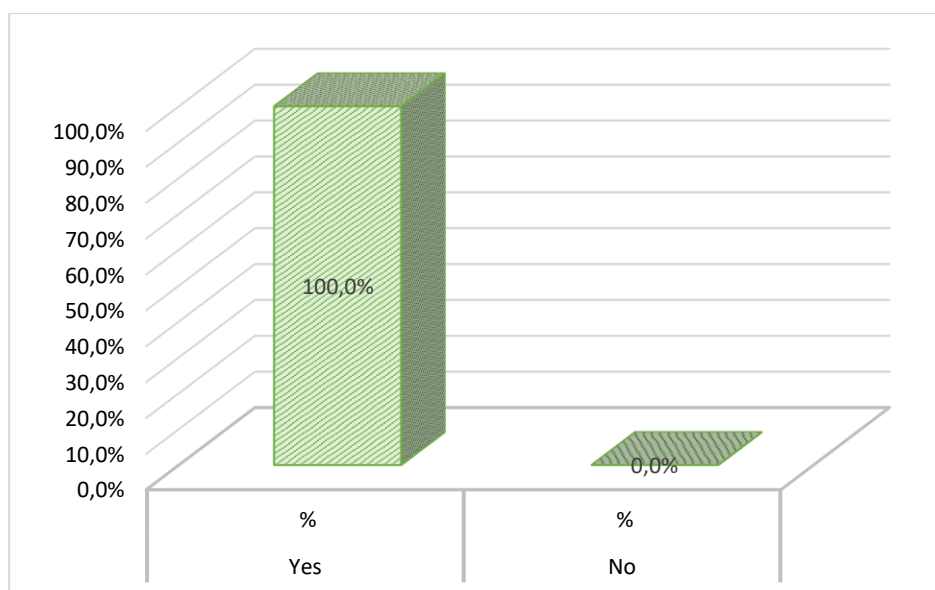


Figure 4.10: Policymakers 'Responses on Teaching Science Courses in English

The findings presented on Figure 4.10 indicate that all the policymakers (100%) support the teaching of science courses in English in order to help students get fully involved in learning the English language. This is also an alternative to the problem of insufficient time devoted to the English course.

The last question was intended to know whether policymakers are in favour of the creation of a coordination board for scientific English courses. The results are presented on Figure 4.11

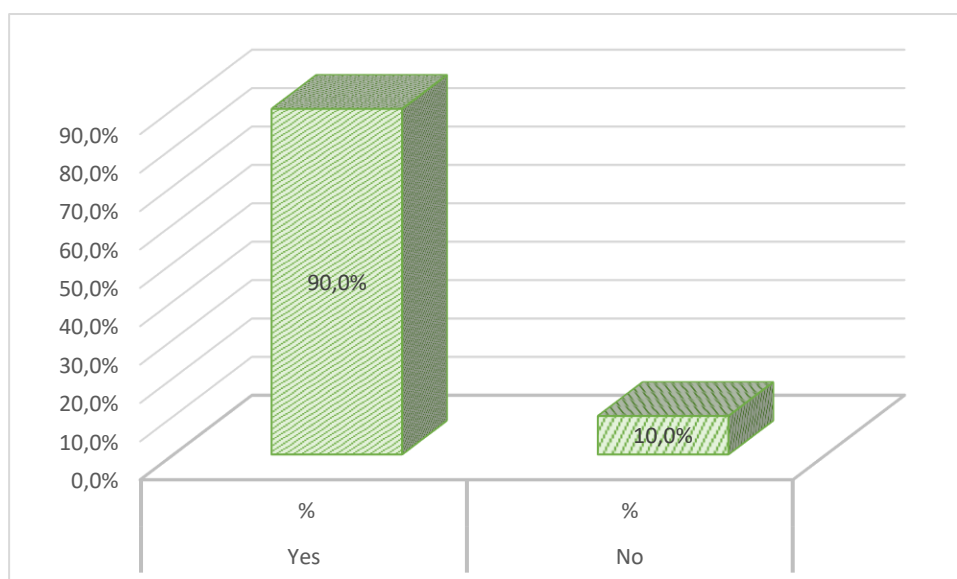


Figure 4.11: Policymakers 'Responses on the Creation of a Coordination Board for Scientific English Courses

Figure 4.11 indicates that a large majority of policymakers (90%) support the creation of a coordination board for scientific English courses. The board would help coordinate the courses, not only at the level of curriculum design, but also at the level of production of common materials for similar fields of study.

4.1.5. Comparison of the Results from the Three Questionnaires

In this sub-section, the results from the three questionnaires (students', teachers' and policymakers' questionnaires) are compared to investigate the extent to which the respondents' perceptions of the needs differ. The findings in this sub-section helped the researcher answer the second research questions and test the first hypothesis of this study (confirm or reject it).

The first hypothesis reads as follows: "there is no statistically significant difference among students, teachers and policymakers in their perception of the English language needs of Natural Science students". Since the term 'needs' involves many aspects (or dimensions), this null hypothesis implicitly consists of many sub-hypotheses. Thus, this section will investigate whether there is a significant difference among the respondents in their perception of the needs, in terms of (1) attitudes towards learning English, (2) awareness of the status of the English language worldwide, (3) the reasons for learning English, (4) the target situations [current and prospective], (5) perceptions of the important skills and strategies, (6) beliefs about language learning, and (7) views on the strategies to improve the knowledge of English in general,

4.1.5.1. The Choice of Statistical Tests

The difference of the perceptions of needs among groups was measured by means of nonparametric inferential tests. This type of statistics was chosen because some assumptions of parametric procedures could not be met:

- The sample sizes were unbalanced, that is, 173 students, 31 teachers and 10 policymakers
- The samples of teachers and policymakers were small
- Being categorical (measured on a 'Yes/No' or 'Yes/No/Not sure' scales), some data could only be used with non-parametric procedures.

Since not all the data were collected from each of the three categories of respondents, the comparison of the needs in terms of (a) awareness of the status of English language worldwide and (b) the reasons for learning English included students, teachers and policymakers on the one hand. On the other hand, the comparison of the needs in terms (a) attitudes towards learning English, (b) the target situations [current and prospective], (c) perceptions of the important skills and strategies, (d) beliefs about language learning, and (e) views on the strategies to improve the knowledge of English in general included only students and teachers. Table 4.40 below provides details on groups compared and the statistical tests used.

Table 4.40: Details on Groups Compared and Statistical Tests Used

N°	What to compare	Compared groups	Statistical test used
1	Attitudes towards learning English	Teachers ¹⁴ , students	Mann-Whitney U-test ¹⁵
2	Awareness of the status of English language worldwide,	Teachers, students and policymakers	Kruskal-Wallis one-way test ¹⁶
3	Reasons for learning English	Teachers, students and policymakers	Kruskal-Wallis one-way test
4	Target situations	Teachers, students	Mann-Whitney U-test
5	Perception of important skills and strategies	Teachers, students	Mann-Whitney U-test
6	Beliefs about language learning	Teachers, students	Mann-Whitney U-test
7	Views on the strategies to improve the knowledge of English	Teachers, students	Mann-Whitney U-test

¹⁴ Teachers in this case refer to subject specialist teachers

¹⁵ Mann-Whitney U-test is the equivalent of the independent samples t-test

¹⁶ Kruskal Wallis one-way test is the equivalent of one –way ANOVA

4.1.4.3. Group Difference in Terms of Attitudes

As indicated in Table 4.40 above, the difference in respondents' attitudes towards learning English was measured using Mann-Whitney U-test since it involved students and teachers only. The results of the Mann-Whitney U-test are presented in Table 4.41 and Table 4.42 below:

Table 4.41: Descriptive Statistics of Students' and Teachers' Attitudes towards English

	Respondents	N	Mean Rank	Sum of Ranks
Mean_Attitudes	Student	173	92.94	16079.00
	Teacher	31	155.84	4831.00
	Total	204		

Table 4.42: Mann-Whitney U-test on Attitudes Towards Learning English

	Mean_Attitudes
Mann-Whitney U	1028.00
Wilcoxon W	16079.00
Z	-5.47
Asymp. Sig. (2-tailed)	.00

The results presented in Table 4.42 show that there is a statistically significant difference between students and teachers in their attitudes towards learning English ($p = .00$, i.e. $p < .05$). This means that teachers and students differ to a great extent in terms of their attitudes towards learning English. Therefore, the null hypothesis is not supported with regard to attitudes. A reference back to Table 4.3 and Table 4.25 can help to find where the difference lies. These tables reveal that teachers had a more positive attitude than students.

4.1.4.4. Group Difference in Terms of Awareness of the Status of English Language

Since the data on awareness were collected from all the three categories of respondents (students, teachers and policymakers), the statistical test used is the Kruskal-Wallis test also

known as nonparametric one-way ANOVA. The results for each item are presented in Table 4.43 below

Table 4.43: Kruskal-Wallis Test on the Awareness of the Status of English Language

N°	Item	Sig	Decision on the null hypothesis
1	English is an international language of science and research.	.002	Reject
2	There is an increase in the use of English as a medium of instruction worldwide especially in tertiary education.	.081	Retain
3	English is closely associated with leading-edge technology.	.009	Reject
4	English is the working language of international organizations and conferences.	.007	Reject
5	English is the working language of international banking, economic affairs and trade.	.568	Retain
6	English is the global language of internet/electronic communication	.163	Retain
7	English is the working language of international law.	.022	Reject
8	English is the language of international tourism.	.759	Retain
9	English is a global lingua franca, that is, a language used for communication between people whose native languages are different from one another.	.120	Retain

10	English is the number one international language of publishing.	.000	Reject
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The results presented in the above table reveal that the null hypothesis is rejected for only 5 out of 10 items. This means that in terms of awareness of the status of English worldwide, there is a moderate difference among students, teachers and policymakers. Although the statistical test results for the three types of respondents indicate a moderate difference, A reference back to Table 4.4, Table 4.26 and Table 4.38 shows that students are less aware of the status of the English language than teachers and policymakers.

4.1.4.5. Group Difference in Terms of Reasons for Learning English

Like the question on awareness, the question on reasons for learning English was asked to all the three groups of respondents. The results of the Independent-samples Kruskal-Wallis Test are presented in Table 4.44 below:

Table 4.44: Kruskal-Wallis Test on the Reasons for Learning English

N°	Item	Sig	Decision on the null hypothesis
1	To get access to academic and scientific sources (books) published in English.	.000	Reject
2	Because students may continue their studies abroad at English medium universities	.020	Reject
3	To increase the chance to get a scholarship to study abroad.	.306	Retain
4	Because English is a global language of science	.001	Reject
5	Because English will give them more job opportunities in the East African Community (EAC) and elsewhere	.332	Retain

6	Because English will help them to work in international companies	.033	Reject
7	Because English is a gateway to the world of science, commerce and culture	.002	Reject
8	Because English is the most spoken second language in the world	.423	Retain
9	Because they will need to discuss with foreign specialists in their domains	.368	Retain
10	Because they may need, in the future, to publish in English	.071	Retain
11	Because they will need English to travel abroad	.199	Retain
12	Because they just need it to obtain their university degree	.006	Reject
13	Because if they learn English they will become better educated	.599	Retain

The findings presented in Table 4.44 above show that the null hypothesis that there is no statistically significant difference among students, teachers and policymakers in their perception of the reasons for learning English is rejected for only 6 out of 13 items. This means that students, teachers and policymakers differ to some extent in their perception of the reasons for learning English. Indeed, many of the 13 items were acknowledged as reasons for learning English by all the three groups of respondents (refer back to the descriptive statistics of the items in Table 4.5, Table 4.27 and Table 4.38). It is notable, however, that there was a pronounced tendency in the acceptance of the reasons by teachers and policymakers than by students. Further analysis of the three tables reveals also that study-related reasons did not get a very high percentage of Yes-answers compared to other reasons (contrary to what might be expected from Science students). These reasons are (1) “To get access to academic and scientific sources (books) published in English”, (2) “Because students may continue their studies abroad at English medium universities, (3) “To increase the chance to get a scholarship to study abroad”. These reasons obtained high percentages of Yes-Answers.

4.1.4.6. Group Difference in Terms of Target Situations

The difference in the perception of the target situations among students, teachers were measured by means of a Mann-Whitney U-test. The results of the test are presented in Table 4.45 below:

Table 4.45: Target Situations as Perceived by Students and Subject Specialist Teachers

	N°	Item	Sig (2-tailed)	Decision on the null hypothesis
Current situations	1	To read the handouts/notes/syllabi that are given in English	.014	Reject
	2	To listen to scientific documentaries in English	.051	Retain
	3	To search for internet resources	.073	Retain
	4	To read science textbooks that are in the library	.037	Reject
	5	To interact with English speaking foreigners	.994	Retain
Future situations	6	To understand documents related to their speciality	.037	Reject
	7	To attend conferences in English	.011	Reject
	8	For work in the East African Community	.123	Retain
	9	To travel to an English-speaking country	.692	Retain
	10	To complete forms and official documents in English	.542	Retain
	11	For work in a multinational company or institution	.595	Retain
	12	To continue their studies (master and/or doctorate)	.592	Retain
	13	To do a job interview in English	.234	Retain

14	To make online applications for scholarship to study abroad	.206	Retain
15	To travel abroad	.018	Reject

The results presented in the above table reveal that the null hypothesis that there is no statistically significant difference between students and teachers in their perception of the target situation is retained for 10 out of 15 items and rejected for only 5 items. This means that overall, students and teachers differ to a small extent in their perception of the target situations in which students use/will use the English they learn at university.

4.1.4.7. Group Difference in Terms of the Importance of the Main Language Skills and Aspects

To measure whether there is a statistically significant difference in students' and teachers' perception of the importance of the main language skills and aspects, a Man-Whitney U Test was used. The results are presented in Table 4.46 below:

Table 4.46: Difference in the Perception of the Importance of the Main Language Skills and Aspects for Studies and Future Career

N°	Main Skills and Aspects	Importance for current studies		Importance for future Job	
		Sig	Decision	Sig	H ₀
1	Reading and understanding	.291	Retain	.301	Retain
2	Writing	.002	Reject	.021	Reject
3	Listening	.065	Retain	.499	Retain
4	Speaking	.229	Retain	.800	Retain
5	Scientific/Technical vocabulary	.005	Reject	.040	Reject
6	English grammar	.229	Retain	.689	Retain
7	Pronunciation	.613	Retain	.062	Retain

The findings presented in Table 4.46 above reveal that in terms of the importance of the main language skills and aspects for students' studies, the null hypothesis is retained for 5 out of 7

items. Similarly, in terms of the importance for students' future job, the null hypothesis is retained for 5 out of 7 items. It therefore appears that whether it be for studies or future career, students' and teachers' perceptions of the importance of the main skills and aspects differ to a small extent. A look back at the descriptive statistics presented in Tables 4.7, 4.8, 4.28, and 4.29 reveals a slight tendency. These tables indicated that teachers perceived many of the skills and aspect as "very important" for student's studies and future career (unlike students who perceived many of these items as "quite important").

4.1.4.8. Group Difference in Terms of the Importance of the Language Sub-Skills and Strategies

As far as the perception on the importance of language sub-skills and strategies is concerned, the difference among students and teachers is presented in the Table 4.47. It was measured using a Man-Whitney U Test.

Table 4.47. Difference in the Perception of the Importance of Sub-skills and Strategies

N°	Types of subskills and strategies	Sig	Decision
1	Speaking subskills and strategies	.002	Reject
2	Reading subskills and strategies	.000	Reject
3	Writing subskills and strategies	.014	Reject
4	Listening subskills and strategies	.069	Retain

Table 4.47 above shows that in terms of speaking, reading, and writing subskills and strategies, the null hypothesis is rejected. This indicate that there is a significant difference between students and teachers in their perception of the importance of these language sub-skills and strategies. For listening subskills and strategies, the null hypothesis is retained. A reference back to the descriptive statistics presented in Tables 4.9 and 4.31 shows that the difference lies in that teachers perceived these subskills and strategies (speaking, reading, writing) as more important than students.

4.1.4.9. Group Difference in Terms of Beliefs about Language Learning

With regard to beliefs about language learning, the findings are presented in Table 4.48 below:

Table 4.48: Difference in Beliefs about Language Learning

Mean_Beliefs		
Mann-Whitney U	1367.500	
Wilcoxon W	16245.500	
Z	-4.317	
Asymp. Sig. (2-tailed)	.000	

The above Table indicates that in terms of beliefs about language learning, the null hypothesis is rejected ($p = .00$, i.e. $p < .05$). This means that there is a statistically significance difference between students and teachers in their beliefs about language learning. In other words, students' and teachers' beliefs about language learning differ to a great extent. To see where the difference lies, it is worth going back to Table 4.19 and Table 4.36. The descriptive statistics in these tables indicate that teachers have stronger beliefs about language learning than students.

4.1.4.10. Group Difference in Terms of Views on the Strategies to Improve Knowledge of English Overall

Like other aspects of needs, the difference between students and teachers in their views on the strategies to improve the knowledge of English overall was measured by means of a Mann-Whitney U test. The results are presented in Table 4.49 below:

Table 4.49: Difference in the Views on the Strategies to Improve Knowledge of English Overall.

N°	Strategies	Sig	Decision on the null hypothesis
1	Reading any English text that is interesting to you	.305	Retain
2	Watching television in English	.260	Retain
3	Watching movies in English	.388	Retain
4	Listening to native speakers on the radio	.531	Retain

5	Revising regularly my English course	.606	Retain
6	Doing the homework	.102	Retain
7	Visiting web sites that are in English	.902	Retain

As indicated in Table 4.49, for all the items, the null hypothesis was retained. This means that in terms of views on the strategies to improve the knowledge of English overall, there is no statistically significant difference among students and teachers. Put another way, students and teachers differ to a very small extent in their views on the strategies to improve the knowledge of English overall. Indeed; a reference back to the descriptive statistics presented on Figures 4.2 and 4.4 shows that these strategies were highly accepted by both students and teachers.

Section 4.2: Findings from Qualitative Data

This section deals with the analysis of qualitative data from interview and existing documentation. Starting with the analysis of interview with students, the section proceeds with the interview with teachers (subject specialist teachers and ESP teachers). It then presents the analysis of the current ESP course descriptions as found in the programmes of Natural Science departments.

4.2.1. Analysis of Student Interviews

The analysis of student interview first considers their perception of the needs. It then explores their appraisal of the ESP course, hence their satisfaction/dissatisfaction with the course.

4.2.1.1. Students' Perception of the Needs

Theme1: Reasons for/Importance of Learning English in Natural Sciences

The majority of the interviewed students believe that they learn/would learn English because many science books (texts) are written in English. The following quotation emphasizes it:

The importance of learning the English language is enormous because if you go to different libraries, you find that many science books such as physics or Maths are in English. That is the reason why it is absolutely necessary to teach the language widely. (Interview 1, Physics student, UB)

This quotation is supported by other students who reported that while they are searching for their studies in the library or on the internet, most of the information is found in English:

As a science student, English is very useful because in our searches¹⁷; we find many things in English, and we often face linguistic problems. When you are searching on the net for assignment and find something in English, you will have to read it well or find a way to translate it into French [...]. (Interview 11, Biology student, UB)

Emphasizing on the usefulness of English language for their search, some students highlighted that the knowledge of English would make it easier to search for information related to their field of study:

As a science student, the importance of learning English is that in science we study a lot of courses. If you know the English language and can translate these courses in English, it would be a great advantage. It would be easy to search in your domain. (Interview 10, Biology student, UB)

In addition to that, some other students indicated that they may get a scholarship to continue their studies in an Anglophone country wherein the knowledge of English is a prerequisite.

Researcher: Thank you so much. As a science student, what are the reasons for learning the English language?

Interviewee: Thank you. This is a good question because nowadays, there are master scholarships abroad, but the knowledge of English is a prerequisite. This is because it is a global language (Interview 22, Biochemistry student, BHIE)

This language is very important especially in the future because, if I continue my studies, I may go in an English-speaking country (Interview 1, Physics student, UB)

With regard to work-related reasons, students highlighted that Burundi is a member country of the East African Community which mainly uses English as a working language. It is worth recalling that Burundi uses mainly French as an official language. Students therefore

¹⁷ Searches here refer to looking for information for students' studies.

emphasised that Burundi's membership in EAC opens up opportunities to get a job in others member countries of this community. The following quotations illustrate this:

In terms of job, as we are in EAC, the English language is very important, it is the language put forward in this community. As we are in the same community, the laws can change. You may get your degree here and go to work in Kenya. In that case, if you studied in French, you will face problems in doing the job. You will then be limited in terms of where you can work whereas the job market would be larger if you knew English. (Interview 22, Bio-chemistry student, BHIE)

Yes. It [English] would be very helpful because, as we are in the East African Community, you may go to apply for a job in another country. I will have to use English in application letters. In that case, it will be an advantage. (Interview 15, Geology Student, UB)

Other students did not mention EAC, but recognized the possibility of getting a job abroad (in an Anglophone country):

The second thing is that in the coming days, we will be abroad. If you go to an English- speaking country, you will have to be able to express yourself. At work, they will use English and if you have poor knowledge of English, you will face difficulties. English is necessary currently and in the future. (Interview 18, Physics student, BHIE)

It is notable that besides the above reasons, there are many other reasons. The other major reasons provided by students are outlined in Table 4.50 below.

Table 4.50: Summary of the Main Reasons for Learning English as Provided by Students

- | |
|---|
| <ul style="list-style-type: none">▪ Many scientific books/texts are written in English▪ Possibility to go abroad (in Anglophone countries) for study or work▪ Knowledge of English makes it easy to search for information about students' domain▪ English is a global language (it is spoken all over the world)▪ Most of the computer programs are in English |
|---|

Theme 2: Target Situations

The researcher explored the situations in which natural science students use/will use the English language. The majority of students reported that they use English while reading for their studies. There is a number of explanations for this. First, students explained that many science books are found in English. Second, some teachers give notes or exercises that are in English, or recommend students to read a book in English. The following are illustrative quotations

There are some teachers who teach us English and other science courses like Mathematics. There are also courses taught in French but when reading, you find many things in English. Even though activities are in French, the teacher tells us to read a book written in English. (Interview 1, Physics student, UB)

Researcher: You say that in some courses like Geology, Chemistry, some chapters are taught in English. Do teachers teach in English or do they give you books/notes which are in English?

Interviewee: Some notes are in English and others are in French. That is to say that sometimes teachers may give the notes in English or we can do our search and read books that are in English. This will help us understand the contents of those books. (Interview 13, Geology student, UB)

What I would add is that in the faculty of science especially in Geology, there are courses that required knowledge of English such as Structural Geology, Cartography, because they give us exercises that are in English. (Interview 15, Geology student, UB)

Another situation in which natural science students use English is while they are searching for information on the net. This is, as some explained, due to the fact that when they search on the internet, most of the results provided by research engines are in English

So, if you have a topic, you navigate on internet and get book in pdf version and you find notions in Maths, Physics, Technology in English and you can understand by yourself. If you go to the library, you will not feel like a stranger when you find a book in English. (Interview 17, Physics Student, BHIE).

Theme 3: Future Situations

As far as future situations are concerned, students expect to do a job which will require knowledge of English:

Because, these days, job offers may organize interview in English or selection tests in English. You may find the whole system in English. It is good! We may even use English on social media (Interview 17, Physics students, BHIE).

Although many students referred to their future job as a potential situation where they can use the English language, some other students reported that they will use English while doing further studies (postgraduate studies):

As far as I am concerned, I wish that my studies don't finish at this level and I hope that the medium of instruction, where I may go to continue my studies, will be a language other than French; it may rather be the English language and in that case, it will be my tool to advance my studies. (Interview 27, Geography student, BHIE)

Theme 4: Preferred Language Skills and Aspects

One of the things investigated in this study is the students' preferences in terms of the four main language skills (reading, writing, listening, and speaking) and language aspects (grammar, vocabulary and pronunciation). The findings from students' interviews revealed that several students would like ESP teachers to focus more on speaking (or oral expression) than on any other main language skill.

I think knowing a language is not knowing writing [skill] a lot, though writing is important. Instead, speaking is more important. So, while preparing a course for science students, the teacher should focus on speaking (oral expression). It is because in our domain, teachers or their programs don't put much attention to speaking [oral expression]. It is as if oral expression was the concern of arts students. So, if teachers focus on speaking, and give time to students to discuss, give them a topic to develop and then present, this would be very helpful (Interview 16, Physics student, BHIE)

In many situations, it is dialogue, face to face interview, so he [ESP teacher] should focus on speaking, how to speak especially that this language is not spoken as other languages. (Interview 22, Biochemistry student, BHIE)

Another main language skill that is highlighted by many students is writing. The following quotation illustrates it:

We need to study writing. It is important to know how to write as we are students. That is why in our department both speaking and writing should be included. (Interview 25, Geography student, BHIE)

As far as language aspects are concerned, many of the interviewed students would like the teachers to return to basic notions of grammar and vocabulary (scientific/technical terms). Some regard these aspects as the foundation for any language since they are involved in different situations, that is, in speaking, writing, listening and reading. The quotations below exemplify students' preferences for grammar and vocabulary:

[...] they (ESP teachers) should focus on grammar. You then use grammar to express yourself and to write. The grammar helps us read the books I said earlier, if you know grammar, it becomes easy. They should focus on grammar and oral expression; grammar and writing go together. We have some knowledge in them. (Interview 25, Geography, BHIE)

Researcher: You say that the teacher should go back to basic notions. Do you mean grammar and vocabulary or what?

Interviewee: I mean, we have forgotten grammar and vocabulary. So, thought he cannot start with them or focus on them, he can just bring them to us or show us because if you don't know grammar and vocabulary, you face difficulties. They are also important. (Interview 6, Maths student, UB)

Some were even more precise in terms of the grammatical aspects for which they showed preference:

In a language, vocabulary, conjugation, should come first. But at this level, they don't teach us conjugation, how to make up sentences in English. We no longer study this. (Interview 8, Chemistry student, UB)

Vocabulary is also necessary because you may talk with someone about the past, the present. There are terms that you have to know and you must also know about the tenses. (Interview 24, Bio-chemistry student, UB).

Theme 5: Preferred Activities

In terms of activities, students displayed strong preference for practical activities especially those engaging them in practicing the speaking skill such as presentations. The preference for such activities is in line with their preference for speaking skill. One student said

What is important is that we get a lot of practical exercises. In these exercises, each student should get a topic to develop. This can help students know more because you may even forget the terms as you are not using them. But when you are working, it helps you remember more. So, this is an important thing. A second thing that a student needs, we have said that you may know how to write something when you don't understand well its pronunciation or how it is spoken. You may write well a letter but when you are told to defend it, you cannot speak. So, what is necessary is that there should be presentations in English so that students get used to speaking English language. (Interview 3, Physics student, UB).

One of the reasons for students' preference for presentations to other types of activity is that such activities help them improve not only speaking (overcoming the fear of speaking) but also improving other language aspects such as grammar, vocabulary, and writing¹⁸ etc.

When we are preparing the topic (writing), we are at the same time learning pronunciation and vocabulary. This is very helpful because you may forget a term but if you ask your friend, he may still remember its meaning and will tell you. So, it helps us in speaking because we keep on speaking English even when we are out of the classroom. This also helps us overcome the fear of speaking. (Interview 17, Physics student, BHIE)

¹⁸ Presentations help students to improve their writing in that while they are preparing for the presentation, they will first write it.

Asked whether they would like individual or group activities, many students argued in favour of group activities. In their explanations, some argued that in group activities, students can help each other, that is, good students can help weak students.

I think group activities are important especially when students are explaining to each other. Indeed, a student feels more comfortable with another student than with his teacher. This is due to the fact that a teacher is his superior. So, a group activity can expand the knowledge. (Interview 23, Biochemistry student, BHIE)

Although many students preferred group activities, some students explained that the groups should consist of a few students.

Researcher: With regard to classroom activities, would you like individual or group activities?

Interviewee: Group activities, from two students, because if there are many in the group, the activity will only be done by the best in the group. But if you are only two or three students in the group, you share ideas. It is better if there are a few students. (Interview 5, Maths student, UB).

Individual activities don't help you know much but if it is a group of 3 or 4 students working together, if they do not neglect the activity, this will help them understand well. So, the teacher should continue on what the students did together. (Interview 24, Bio-Chemistry student).

Despite the strong preference for group activities, some students pointed out the shortcomings of these activities. They explained that in group activities, some students do not really work since they rely on what other members of the group did. One student commented:

What I have realized at university and in others schools, with regard to group activities, it is true that some students work, others don't make an effort. So only those who are good at English will understand. But in case of individual activity, each student will search because the group will not be there to support him the time of presentation; he knows that he will have to show the knowledge he has. He can then search alone and will make an effort to try to get what he will present to others. (Interview 19, Maths student, BHIE)

Other students argued for a combination of both individual and group activities. They explained that if both activities are combined, each type of activity will compensate for the shortcomings of the other:

I think that both types of activity should be given because, in group activities, some students don't work. But if both individual and group activities are given, there is compensation and this will help those I can call lazy students. If it is a group activity, we share ideas, we decide on what to do and there is explanation. But when you are alone, you can search here and there. So, there should be both activities. (Interview 15, Geology student, UB)

Theme 6: Preferred Materials: Audio-Visual Materials

Students were asked whether the use of audio-visual materials in the classroom would help them improve their English. Many of the interviewed students favoured the use of audio-visual materials to show videos related to students' domain like documentaries. One said:

There is what I often see in Biology courses, a teacher can project a film to watch like embryonic development. If he projects and we listen, this helps us to know more. If you watch and listen to something, it is very helpful. So, while learning English in the sciences, projecting would be very helpful. (Interview 22, Biochemistry student, BHIE)

Students also argued that audio-visual materials would help them improve their pronunciation. One said.

While we are studying English. It is necessary to listen to audio-visual materials because it is helpful. You may know something but have problems with pronunciation. While you are listening to audio, you can easily adapt to pronunciation and correct yourself. With regard to a projector or TV, these can also help us if you listen and watch, you will see how something is pronounced. (Interview 17, Physics student, BHIE)

Another student commented:

I think there are different accents in English. The teacher should then use videos or audios reflecting different accents and then should explain. Because

you may talk to someone and not understand him because of his accent.
(Interview 13, Geology student UB)

Theme 7: Preferred Methodology as Viewed by Students

Students were asked to give their views on the appropriate methodology that they would like their ESP teachers to use. The findings revealed that the teacher should not speak alone. He (the teacher) should rather give them time to speak or do practical activities like presentations, topic development. The following quotations illustrate students' views on how the ESP teachers can proceed. One student said:

But our teacher uses a good methodology. There is time to teach and time for us to speak. We are given many practical activities to present. In languages, if you don't speak yourself, you will not know anything. The fear of speaking will remain, and even what you know, you will not know whether is correct or not. But when you speak, the teacher will tell you if it is correct or not.
(Interview18, Physics student, BHIE)

Another student added:

I would like to thank a lot a teacher that was once assigned to us because he focused on giving us the time to speak. Although he has a short time, he could use it efficiently. Each student had time to speak in front of others and this was very helpful to work together. He assigned us a work to search about and each student knew that he would at least speak because he did not know who the teacher will ask. This helped students to overcome the fear. I would then appreciate it. Another thing that I would like to add is that teachers should make more effort and focus on what we need (Interview 2, Maths student, BHIE)

Some other students suggested that since the teacher cannot teach all what they need (due to the time), he should teach them strategies that would help those (students) continue the learning even after the course. They also explained that the teacher can make use of ICT by sending what to learn via telephone like audio file to improve listening.

Because the time is short, teacher should give strategies to students because he cannot teach all, but he should show students how they can learn by themselves (Interview 27, geography student, BHIE)

As far as the use of other languages (use of translation) in the ESP course is concerned, many students supported it. One student reported:

It is better that if the teacher explains and students don't understand, he translates in French and if necessary, he can use Kirundi because if something is in English and you know it in French and in Kirundi, it is not easy to forget it. (Interview 10, Biology student, UB)

Another one added

He can use it [translation] to help students understand but this should not be a habit because it will seem as if we were learning that language. So, he should not explain the whole text in French. In that case, you cannot say that you are learning English. You will then tend to express your message in Kirundi (Interview 14, Geology student, UB)

Theme 8: Difficulties Faced by Students

Subtheme 8.1: Difficulties in Reading

Many students reported that they face difficulties in reading for their studies, that is, reading scientific texts/books, the following quotation illustrates it:

Researcher: In case you come across a science book written in English, will it be easy to read and understand it?

Interviewee: Personally, it would be very difficult because I have problem in English language. I can only get the idea of what it is about but I cannot speak or understand a lot. (Interview 10, Biology student, UB)

The reasons behind the difficulties in reading, as students explained, are (1) less attention/importance given to English, (2) difficult terms in science texts, (3) low level of English. The following quotation illustrates difficulties related to scientific terms:

Researcher: If you consider your level of English, would you find it easy to read and understand a science book that is written in English?

Interviewee: Not very easy because in science texts we studied in the English course, there were terms difficult to understand. Unless you are motivated to search and have a dictionary, the English for physics becomes difficult. (Interview18, Physics student, BHIE)

Some students do not even try to read in English, they therefore resort to using French books:

Interviewee: Yes, in the library, many books are in English. The problem is that the book containing a lot of information, you find it in English. In that case, I for example, look for another book in French. This is a problem we often face because of the English language.

Researcher: Though the book is rich you cannot use it because of the problems you have in English?

Interviewee: Even when I use it, I just look at the formulas, because formulas don't change, but I don't understand what the book is about. In that case, you cannot understand even if you read it. You just do Maths without explanation. (Interview 6, Maths student, UB)

Sub-theme 8.2: Difficulties in Speaking

Like in reading, students highlighted the difficulties they face in speaking. One student said:

As far as I am concerned, I can write and succeed in writing, but when it comes to speaking, I make a lot of mistakes. If a teacher asks a question, I may understand it, but I cannot answer in English, this is the problem I face but I think it is not only my problem; others may face it. (Interview 27, Geography student, BHIE)

Another student highlighted:

You may know how to read but have difficulties in speaking because you don't have it in your mind. When you are reading alone; it seems as if what you read is in your head but when it comes to speaking, you cannot. (Interview 21, Maths Students, BHIE)

Sub-theme 8.3: Lack of Motivation

The findings from student interviews revealed that some students face the lack of motivation to learn the English language. The main reason behind this is that they pay much attention to sciences courses. One student expressed himself:

In general, as we are in natural sciences, there are many science courses and we put much attention to these courses. We are more interested in Maths, Chemistry, and Physics. (Interview 21, Maths Students, BHIE)

Other students explained that they are not interested in English language because they will not use it in the future:

So, as we will not use the English we are learning, we don't give an important place to that language and because in our everyday life we will not use what we are learning, it will not help us, there is no need to make effort. (Interview 20, Maths student, UB)

4.2.1.2. Appraisal of/ Satisfaction with the ESP Course

Theme 8: Relevance of the ESP Course to Students' Field of study

Students were asked whether what they are taught in ESP courses is relevant to their field of study. Many of them acknowledge that the contents of the ESP course are relevant. However, in situations where students are combined from different departments, they [students] complained that the teachers tend to focus on one domain (though the domains are not far away from one another)

The English we learnt in 1st year is very rich and very useful. But in second year, we got a problem. We studies English for Chemistry and Biology. We did not study English for Geology. We studied English for Chemistry and Biology. It is necessary too, but they [teachers] should integrate English for Geology (Interview 13, Geology student, UB)

Some students however did not appreciate the ESP course because they were not given what is related to their domain.

What I don't appreciate is that they don't put much focus on things related to our domain. Most of the time they focus on grammar. But because we have

basic notion in grammar, they should help us to make use of it in what we use in our domain. (Interview 26, Geography student, BHIE)

Although many students recognized that the contents of the course are relevant to their field, some others expressed their interest in grammar but they were alluding to their preference for being taught general English:

So, you will not see grammar again, because teachers will say that you saw it in high school and will continue with their domain. So even those who manage to know English, they will know scientific English only, but it will be difficult for them to express themselves. Because, there should be connecting words or grammar that will help you express your ideas. (Interview 3, Physics student, UB)

In our section of Maths, in the English course, we are taught Maths like square root, graphs, etc. So, we don't study a lot of grammar that we can use in our everyday life. (Interview 20, Maths student, ENS)

Theme 9: Appraisal of the Time Allocated to the ESP Course in Natural Sciences

With regard to the time allocated to the ESP course in Natural Science departments, all the interviewed students insisted that it is not enough. Below are two illustrative quotations:

For someone who is thirsty of knowing English, the time is not enough because the English language requires practicing and practicing, or meeting with people who use it, or staying with someone who can encourage you to like the language. So, 30h is a very short time because you can finish 30h in just one week or two. (Interview 19, Maths student, BHIE)

[...] the English language is very useful but it is given only 30h. If you are absent for 4h out of 30h, you will still have only 20h and something. So, you will study a few things in 20h and then the course is finished. Sometimes I wonder what will happen if we compete with other students who studied English well. (Interview 18, Physics student, BHIE)

Not only did students say that the time for the ESP course is short, they also explained why that time is short. Their explanations are summarised in the Table 4.51 below.

Table 4.51: Students' Explanations of why the Time for ESP Course is Short

- The time for activities is limited; the ESP teacher cannot give many activities as necessary.
- The teacher can finish the course in just one week.
- The ESP teacher does not get the time to go back to what students did not understand.
- In case of combined classes, the teacher does not get the time to cover all the students' fields of study.
- Students learn a few things and it is just to validate the course (getting the average mark required to pass the course).
- The teacher runs with the time (hasten things) and students don't understand.

Theme 10: Students' Dissatisfaction with the ESP Course in General

An analysis of the data from interview revealed also that students expressed dissatisfaction with the ESP course in many respects. First, students complained that the course is given less attention (less valued) though it is very useful. Second, they complained about the lack of materials; they reported that they do not even have a (course) book to use. One said:

As I said, the English is given less attention. In our department, the English is less valued and we learn it only during the English course (Interview 12, Biology student, UB)

Another dissatisfaction is that the ESP course is taught by language teachers rather than a science teacher. They expressed the wish to be taught English by a science teacher because, they say, language teachers sometimes do not understand themselves the science concepts they are supposed to deal with. One student explained:

What I don't appreciate is that the English teacher is from the Faculty of Arts and Social Sciences. Because he doesn't master sciences, he focuses on, as I said, what he can teach. It would be better if he focuses on our domain (Interview 15, geology student, UB)

It is said that in the years ahead, no language teacher will come to teach the English course in the Faculty of Sciences. It will be a science teacher who could teach English in science fields. It is understandable; how come a

language teacher, like an English teacher can teach English [for Sciences]. It would be difficult for him to teach scientific English whereas he studied general English. Because there are terms that he himself doesn't understand. It is true that you know English, if a student asks you, you find it difficult to answer his question because you yourself don't understand it (Interview 3, Physics student, UB)

Theme 11: Students' Recommendations for Promoting the English Language in Natural Science Departments

In order to promote the English language, students proposed a number of solutions. Their major recommendations are threefold: (1) increasing the time allocated to the ESP course, (2) teaching some science courses in English, and (3) creating and supporting English clubs in science departments.

Sub-theme11.1: Increasing the Time Allocated to the ESP Course

As all the interviewed students reported that the time allocated to the ESP course in science departments is short, many of them proposed, as a solution, an increase of that time. Some suggested an increase of 15 or 30 hours in each year; other proposed that the course be taught even in the third year of undergraduate studies. One said:

The time is really not enough because as I said, 30h is just one week and the course is done for the whole year. If it were 60h or if the course were taught every semester, the time would be enough. (Interview 11, Biology student, UB)

Another added:

The time should be increased from 30h to for example 45h. This would be very helpful if 15h are added and the teacher will get more time to teach using appropriate methods. (Interview 22, Biochemistry student, BHIE)

Sub-theme11.2: Teaching some Science Courses in English

Another recommendation that students formulated so as to promote the English language in natural sciences is to teach some of the science courses in English. Such argument is based on students' belief that if some courses are taught in English, they will have more time to stay in touch with the English language.

There should be a reform of the programs so that some courses be taught in English. This will help us as we are in EAC, we can teach in another country and in English. (Interview 2, Maths student, UB)

The students' argument for teaching some courses in English is based on their belief that if some courses are taught in English, they will have more time to stay in touch with the English language. Here is an illustrative quotation as expressed by one student:

In order to improve our language, the time should be increased. That is, if we study 16 courses, 8 of them should be taught in English. If we study the English course only for 30h, it is like, when the course finishes, we are done. But if we had 8 courses in English and 8 others in French, there would be a balance. In that case, we will be able to search both in English and in French. (Interview 3, Maths student, UB)

Sub-theme 11.3: Creating and Supporting English Clubs in Science Departments

A third major recommendation that students made is to create and support English clubs. Some students even went as far as suggesting that the participation in clubs should be compulsory. One student said:

My recommendation is that they [authorities] allow us to meet so that we practice speaking English and teach each other. They should just give us time for English clubs like there are clubs of science, Biology, Chemistry. (Interview 2, Physics student, UB)

One explanation for supporting the English clubs is that when students meet in clubs, they feel more comfortable than when they are in classroom with their teachers. A student commented:

What is needed is the English club so that those who wish can improve that language. Because a club is a class where students feel free (comfortable). Sometimes students, when they are with the teacher, they don't feel comfortable because they think they are making mistakes. But if you are equals, you can choose a topic to discuss or to develop as usual. If you are with your peers, you feel comfortable and if you are at ease, the mistake will gradually end by themselves. (Interview 3, Physics Student, UB)

4.2.2. Analysis of Subject Specialist Teachers' Interview

Theme1: Reasons for/Importance of Learning English in Natural Sciences

The major reasons that subject specialist teachers outlined are related (1) to studies and research and (2) to work. With regard to studies and research, subject specialist teachers explained that a great number of science books are written in English. Therefore, the knowledge of English will help students while searching on a given topic. They also explained that students may get a scholarship to continue their studies in a country where the knowledge of English is a prerequisite. Below is an illustrative quotation from an interview with a Geography teacher:

As we are in the natural science department, you will find that lots of the works [books], in many places are [written] in English. And even when you want to continue studies, if you have a good command of English, you can continue your studies in any system. (Interview 31, Geography teacher, BHIE)

In terms of work-related reasons, Subjects specialist teachers highlighted that Burundi is a member of the East African Community and that Burundians can apply for a job in other countries. A teacher in Earth Science (Geology) said:

Suppose they finish their studies at the undergraduate level and they want to start professional life, as we know society today, applying here and there, sometimes even job offers are announced in English. The candidate will have to be able to read and understand what is in the job offer, and he can apply by writing his CV correctly, or writing in English all what is necessary to get the job in English. (Interview 29, Earth science Teacher, UB)

For a detailed view of the reasons provided by subject specialist teachers, they are summarised in Table 4.41 below:

Table 4.52: Summary of the Main Reasons for Learning English as Provided by Subject Specialist Teachers

- | |
|---|
| <ul style="list-style-type: none">▪ English is the language of communication all over the world▪ Most of science books/texts are written in English▪ English is the preferred language of science |
|---|

- Knowledge of English provides opportunity for a scholarship
- To publish in English so as to get many readers
- To apply for a job in other countries wherein the knowledge of English is a prerequisite.
- To continue studies
- Most of the programming languages used in sciences are in English

Theme 2: Target Situations

Like students, subject specialist teachers were asked about the situations in which Natural Science students use/will use the English language. One of the situations highlighted by teachers is reading books for studies. This is because, as teachers explained by teachers, most of science books are written in English. However, one teacher mentioned that students are nowadays lazy and do not follow up references or look elsewhere.

Another situation in which students need English language is using programming languages. It is worth reminding that teachers highlighted that most of the programming languages are in English (pseudo-English). This is illustrated by a quotation from an interview with a teacher in Physics department.

Well, in the courses, for example, in which I intervene, sometimes we need the language because, for example, I teach numeric analysis and programming courses, most of the programs or programming languages that we have, apparently, I know only one language which is coded in French. But much of the language is pseudo-English. (Interview 28, Physics teacher, UB)

Prospective situations such as working or studying in the East African Community were also mentioned. Below is what a Geography teacher said:

Today the world is open. You can apply for example, in [member] countries of the East African Community. It is open, there is job opportunity today and the knowledge of English is a prerequisite. So, in the future, English is very important, as students can get a chance to continue their studies and if they have a good command of English, they will find it easy to continue their studies.

Theme 3: Language Skills and Aspects that Students Need the Most

In terms of language skills (reading, writing, listening and speaking) and aspects (grammar, vocabulary, etc.), subjected specialist teachers insisted on vocabulary related to students' domain. In respect of this, one teacher said:

In Maths, it is not important to talk about someone, for example, who wrote books in Germany, United States, that is, give students novels. Rather, we have to help them understand for example, vocabulary used [in Maths], that we use in Geometry, in Analysis, Algebra, Statistics, Probability, because they need it. They need vocabulary too much, especially as they are no dictionaries available. So, it is better to adapt the programs to students' fields. (Interview 30, Maths teacher, BHIE).

Another teacher explained the need to focus on all the language skills and aspects, that is taking the language as a whole.

Normally when we speak of a language, mastering a language is in fact to master all these aspects, linguistic and grammatical, all that stuff. So, I can't say I master the English language if I don't master grammar; I can't say that I speak English if I don't know about syntax, all that, and so on. So, it's better that we know the language as whole (Interview 31, Geography teacher, ENS).

Another teacher also emphasized on the wholeness of the language and said:

[...] we cannot say that science students need a particular skill; the minimum would be the best. Whether it be grammar, oral communication or whatever, even writing is also very important (Interview 28, Physics teacher, UB).

Theme 4: Views on the Use of Audio-Visual Materials

Asked whether the use of audio-visual materials would help students to improve their language, subject specialist teachers agreed. They explained that the use of these materials can be of great importance in situations where there is lack of laboratory materials since educational videos can be used to show how an experiment is conducted in a laboratory. In respect of this, one teacher explained:

Yes, yes, that [the use of audio-visual materials] is very important if they watch a video, especially that, there are no teaching materials. For example, someone who does chemistry, you see there is no [well equipped] laboratory, but if you find a documentary that speaks, which shows someone in the laboratory, where there are chemical elements and so on, he handles chemical elements[products] in English. Students listen and will have a lot of questions, and will understand a lot of things. That is very important, that is very, very important even. Even in Mathematics you can show someone who is teaching Mathematics in English. (Interview 30, Maths teacher, BHIE)

Another explanation for the support of the use of audio-visual materials is that they can help inspire students as to how to communicate effectively. This is illustrated by a quotation from an interview with a teacher in Physics department:

When we look at how others speak, how they behave in front of an audience, as they make a communication, I think that the use of such tools can also help and also try to inspire people to have the techniques to communicate (Interview 28, Physics teacher, UB).

Although subject specialist teachers were in favour of the use of audio –visual materials, they reported that teachers of English in science departments have to make sure that students understand what they are watching or listening to and this will depend on the initial level of students. This was highlighted by a teacher in Earth science.

Yes it [the use of audio-visual materials] can help them, but I think that, again it will depend on the students' initial level of English, because with audio files, with the radio, with these documentary films, it is specialists who are speaking. If at the beginning students watching the videos do not understand what is being said, if their vocabulary is low, the result may not be good. But if it is to improve through what is talked about in the film, it's a good method. (Interview 29, Earth Science teacher, UB)

Theme 5: Science Teachers' Views on the Appropriate Methodology to be used by English Teachers

Subject specialist teachers were asked to provide their views on the appropriate methodology to be used by ESP teachers. They insisted that ESP teachers should give more practice than

theory. By practice, they were alluding to the speaking skill. They therefore argued for the participation of each student. In regard of this, one teacher said:

As I said, the first thing is practice, it is not necessary to look for more sophisticated presentations, you can give an exercise in Maths, if a student does the exercise and speaks at the same time, that's really very important. (Interview 30, Maths teacher, BHIE)

Another teacher added:

It is better to focus on the participation of each student. By participation, I mean, opportunity, the chance, for students to express themselves in English because it is by expressing themselves, it is by familiarizing with speaking English that they [students] will master English. (Interview 31, Geography teacher, BHIE)

Theme 6: Appraisal of the Time Allocated to the ESP Course in Natural Sciences

Regarding the time allocated to the ESP course in Natural Science departments, subject specialist teachers agreed that it is very short and cannot enable students acquire all the necessary skills in English. Below is an illustrative quotation:

I think it's a course whose time is perhaps, not very consistent, that cannot, in my opinion, enable students to get a good command of English (Interview 31, Geography teacher, BHIE)

Theme 7: The Use of English in Teachers' Profession

In terms of the use of English in their teaching profession, subject specialist teachers reported that they only use that language while preparing or updating their course, but not in the classroom. It may happen however that some teachers give notes/ syllabi that are in English but the evaluations are conducted in French

The use of English in the teachers' profession is consistent with the fact that many of the books they use are found in English. Thus, they recommend students to read science books in English as they provide them with a list of all the references consulted while preparing or updating their science courses. Below is an illustrative quotation on the use of English in teachers' profession:

Well, the use of English in my profession here, I would say that I use it especially while preparing the course. In this case, I consult books which are in English, in French, in both languages. I use them and I noticed that a lot of books that I consult are written in English but I prepare the course in French. So, I use it especially while preparing, that is, while reading different documents which help me to prepare the course. Otherwise, I never use it in the classroom. (Interview 31, Geography teacher, BHIE)

Theme 8: Subject Specialist Teachers' Recommendations for Improving the English Language in Science Departments

In order to promote the English language in science departments, it was recommended that the English course be given an important place in the curriculum. Therefore, the time allocated to that course should be increased and this will help teachers to deal with all the necessary skills and aspects that students need. In regard to this, one teacher said:

It would be better if the programme is revised so that English is given a considerable importance among others courses. For example, we can multiply by two or even by 3 the time allocated to the English [course] so that English teachers can get time to teach all the aspects of the language, grammar, syntax, all that. (Interview 31, Geography teacher, BHIE)

Asked whether they would recommend the authorities to let science teachers (who can) to teach in English, subject specialist teachers agreed. However, they insisted that science teachers should have the necessary competence to do it (teach in English) and that students should have at least the minimum knowledge required to understand the course. Below is what one teacher said:

Yes, I would recommend this because, you see, now we teach students up to a certain level. Since it's free [to move], students from here (UB) can go and pursue their studies elsewhere, if they were used to these presentations in English, it would be an advantage. [...]. But this will be conditioned by how these students understand what is taught [in English]. If in the end students fail, then this language of instruction should not be encouraged. (Interview 29, Earth Science teacher, UB)

4.2.3. Analysis of ESP Teachers' Interview

Theme 1: Reasons for/Importance of Learning English in Natural Sciences

Like students, the reasons for learning English as was outlined by ESP teachers are study-related and work-related. Those reasons are: (1), many science books are written in English. (2) To continue post-graduate studies. (3) To conduct research or publish in English. (4) To compete for a job in the East African Community. In terms of competition for job, one teacher said:

We are in the East African Community where we have to compete. So Burundian learners will compete with other learners from English speaking countries of the community. So, there is no way they can compete if they do not share the language of communication or if there is a job offer, they cannot compete since the language can be a problem for them. (Interview 33, ESP teacher, BHIE)

Theme 2: Target Situations

ESP teachers were also asked about the current and prospective situations in which students use/will use the English language. The main situation highlighted by ESP teachers is that students use English while consulting books either for their studies or assignments. Below is an illustrative quotation from an interview with an ESP teacher:

When they are given an assignment, so they have to get answers for the assignment, I think they use the English they learn to consult books, which are in libraries, which are written in English. (Interview 33, ESP teacher, BHIE)

Theme 3: Language Skills and Aspects that Students Need the Most

ESP teachers were also asked to tell the language skill or aspect that science students mostly need to learn. They highlighted the strong need for vocabulary related to students' field of study (scientific or technical vocabulary). In this regard, one teacher said:

Our students in science need most vocabulary. Because for them the focus is not on well-articulated or well-grammatically organized sentences, but what is important for them is communication and once, then they know, they have,

a wide range of vocabulary; they can easily communicate, there I will say that they need more vocabulary than other areas of the language. (Interview 34, ESP teacher, BHIE)

Although ESP teachers emphasized on scientific vocabulary, they also acknowledged the need to consider the language as a whole, that is, students should be exposed to all the language skills and aspects. The idea behind this is that these skills and aspects are called upon for an effective communication.

Well, since the English language has been designed to be part of the curriculum, then it should be dealt with as a whole, that is focusing on all the language skills. Because if you are teaching a given language, you are aiming at communicative competence (Interview 33, ESP teacher, ENS)

Theme 4: Selection of the Contents of the ESP Course.

ESP teachers were asked about how they select the contents of their course. One ESP teacher reported that in the departments of Maths and Physics, he based his course on a coursebook that was agreed upon in a staff meeting. For other department of the Faculty of Science, the teacher relies on notes prepared on a daily basis. Here is what he said:

I am given the book to use which was decided by the university; there is a meeting which was held in Gitega, I think it was in 2016. There is a book they decided to use which is, the title of book is “Do you speak sciences? [...] in these other departments, Chemistry, Biology and social sciences where they didn’t decide which book to use, this book was decided to be used in mathematics and physics, so in these other departments, I design my own notes. Because I combine them [students], I try to get something from biology, something from chemistry, but I try to get what is mostly used (Interview 32, ESP teach, UB)

At BHIE, ESP teachers reported that they consider the contents as proposed in the programmes of the department, but may add some topics other than those proposed.

[...] then when I am dealing with this course [ESP course], of course there are some proposed contents, but I have to improve, considering what they need, that is why I have told you that sometimes I have to deal with listening

and speaking and also need tell them why they need this, and sometimes I tell them that they should go further. (Interview 33, ESP teacher, BHIE).

Theme 5: Views on the Use of Audio-Visual Materials

ESP teachers were also asked about whether the use of audio-visual materials would help students improve their language. They confirmed that such materials would be of great help as they provide students with the opportunity to listen to native speakers. This will then help them improve their listening and speaking skills and also their pronunciation.

Of course, for some topics, we need audio-visual materials or support, this would help. [...]. I think there should be opportunities where my learners are introduced to how native, yeah, native speakers' accent like maybe American English, or like British English but, due to the lack of materials I don't do it. And also, for visual support, this is also to be good especially because you know pronunciation goes with the description of the physical features, [...] (Interview 34, ESP teachers, UB).

Theme 6: ESP Teachers' Appraisal of the ESP Course.

In terms of the time allocated to the course, ESP teachers acknowledged that it is not enough. Consequently, they cannot deal with all the important topics.

The 30h that are allocated to the English course are not enough. That is why I am always sensitizing them [students], telling them that if you get an opportunity to listen to spoken English you, if you have time you could join any English club. You could join that because you need to consider [the statement] that you are science students [and] that you don't need English (Interview 33, ESP teacher, BHIE).

In terms of satisfaction with the objectives of the ESP courses as stated in the programmes, ESP teachers reported that they are satisfied. They however raised the issue of time constraints which prevent them from expanding the topics dealt with in the course.

I am satisfied, the only problem is that they are just given two courses at university, [...] if I can suggest if possible, you know it is not easy, normally they should increase the number of hours so that they can get enough time to practice and to use the language (Interview 32, ESP teachers, UB).

ESP Teachers' Recommendations for Promoting the English Language

Like students and subject specialist teachers, ESP teachers formulated a number of recommendations to improve the English language. They are listed below:

- Increasing the time allocated to the English course in science departments. This would help ESP teachers deal with all the necessary skills and aspects and students would get enough time to practice.
- Considering the English course as an important subject
- Encouraging students to use books that are written (published) in English especially while doing their assignment. By using English, they will not only be learning about their science courses, but also will be improving their knowledge in English.
- Inviting learners to like the English language by raising their awareness of its importance. This will help students keep on learning the language independently of the teacher by reading books in English, Joining English clubs or listening to English music
- Adapting the ESP courses to the needs of the students
- Introducing the course periodically (for example 4h a week) rather than intensively (finishing the whole course in just a week). This would help students stay in touch with the language for quite a time and hence they cannot easily forget what they learn.

4. 2.4. Results from Consulted Documentation

In this sub-section, the researcher presents the results obtained from the analysis of relevant documentation. The existing documentation was consulted to get an understanding of the state of play of the teaching of English in Natural Science departments and therefore be able to evaluate the adequacy and effectiveness of the current English courses. The results presented in this sub-section were merged with those obtained from the questionnaire and interview in the discussion of the findings. They were matched with the identified language need of Natural Science students so as to address the third research questions and verify the second hypothesis. But, before proceeding, it seems reasonable to remind the reader of what is evaluation by putting it in the context of the present study.

According to Brown (1995, p.218), evaluation is defined as ‘the systematic analysis and collection of all relevant information necessary to promote the improvement of a curriculum and to assess its effectiveness within the context of particular institutions involved’. Language programs/courses can be evaluated for different purposes such as accountability, effectiveness, etc (Noris, 2016). According to Hutchinson and Waters (1987, p.96), evaluation is a matter of judging the fitness of something for a particular purpose. It is basically a matching process, that is, matching needs to available solutions (ibid, p 97). The solutions in the present study correspond to the current ESP courses.

Evaluation covers a wide range of aspects; its scope is broad as it can range from evaluating the objectives to teaching and learning, and to materials (Macalister & Nation, 2010; Zohrabi, 2012). It is however worth noting that, as Dudley-Evans and St John (1997) explained, it would be unrealistic to evaluate everything. For this reason, the consulted documents are the English course descriptions as provided in the curricular documents of the concerned institutions. The main information provided in these documents includes objectives, main contents and references.

4.2.4.1. General Objectives

As far as general objectives were concerned, the researcher examined first whether they were provided in the English course descriptions. Then the researcher analysed whether the general objectives were clearly related to students’ specific field of study, say, Biology.

Table 4.53: Analysis of the General Objectives of the English Course as Provided in the Programs of Natural Science Departments

Institution	Field of Study		General objective (if any) as stated in the curriculum (General objective = Goal or major aim)	Is the general objective clearly related to students' specific field of study?
UB	Biology	1st Year	Not specified	Not specified
		2 nd Year	Not specified	Not specified
	Physics	1st Year	Not specified	Not specified
		2 nd Year	Not specified	Not specified
BHIE	Bio-Chemistry	1st Year	Provide appropriate language skills to Biology and Chemistry students in order to deal with scientific information.	Yes
		2 nd Year	This course aims at providing Biology and Chemistry students, 2nd year, with appropriate language skills in order to deal with scientific information	Yes
	Physics	1st Year	To enable students to express themselves in intelligible English	No
		2 nd Year	To refine students' abilities to express themselves in intelligible English	No
	Maths	1st Year	To enable students to express themselves in intelligible English	No
		2 nd Year	To refine students' abilities to express their mathematical knowledge in English	Yes
	Geography	1 st Year	Equip the students with appropriate technical English terminologies to	Yes

			understand documents written in the English language.	
		2 nd Year	Build confidence in using English as a foreign language while for academic purposes	No

As indicated in the above table, for some fields of study such as Biology, Physics at UB, the general objective is not given in the English course description in the departmental programme (*offres de formation* in French). Consequently, the change that the course will bring about in students is not clear. At BHIE, although the general objective is given for each level, it is poorly stated or does not reflect students' specific fields of study (except in Bio-Chemistry). For example, in first and second years in Physics, the general objective is formulated in the sense that students are expected to be able "to express themselves in intelligible English". It is not clear whether the phrase 'intelligible English' refers to General English or Scientific English or both. Besides, the focus of the course is not clear (Express themselves in Writing? Speaking? Or both?)

4.2.4.2. Specific Objectives

In terms of specific objectives, the analysis of the English course descriptions was guided by the following questions:

- Which of the four main language skills is/are referred to, be it implicitly or explicitly?
- Which of the language aspects of grammar and vocabulary is/are referred to in the objectives?
- Which of the language skills or aspects is to be given much emphasis in the course?

The results are presented in Table 4.54 below:

Table 4.54: Analysis of the Specific Objectives of the English Course as Provided in the Programs of Natural Science Departments

Institution	Field and level of study		Which of the 4 macro language skills is/are referred to in the objectives?	Which of the language aspects of Grammar and Vocabulary is/are referred to in the objectives?	Which of the language skills or aspects is to be given great emphasis throughout the course?
UB	Biology	1st Year	All of them	None of them	*Speaking skill (discussing science for or against) *Writing skill (annotating a diagram)
		2 nd Year	All of them	None of them	*None
	Physics	1st Year	Speaking	None of them	*Reading (English text in general)
		2 nd Year	Speaking	Both of them	*Not clear
BHIE	Bio-chemistry	1st Year	Speaking, reading and writing	Both of them	*Speaking * Grammar
		2 nd Year	Reading	Both of them	*Not clear
	Physics-Techonogy	1st Year	None of them	Vocabulary	*Not clear
		2 nd Year	Speaking and writing	Grammar	*Speaking *Writing
	Maths	1st Year	Speaking and writing	Grammar	*Speaking (but not in scientific context) *Writing
		2 nd Year	None of them	None of them	Not clear
	Geography	1st Year	Reading	Vocabulary	*Technical terms *Reading
		2 nd Year	Speaking Writing	Vocabulary	Speaking

The data presented in the above table show that of all the fields of study (with the exception of Physics at UB), none referred to all the four macro-skills. Indeed, in some classes (e.g. 2nd Year in Maths at BHIE), none of the four main language skills is referred to. In other classes, only one skill is mentioned (eg 2nd year in Bio-Chemistry at BHIE; 1st and 2nd year in Physics at UB). What is more, the skill of listening is under-represented in almost all the classes (only in Biology department at UB). With regard to grammar and vocabulary, there are departments where these language aspects are not mentioned.

It is worth noting that mention of a language skill or aspect in the objectives is one thing, reflecting it in the contents of the course is another thing. Put another way, some skills are just mentioned in the objectives but not actually taught. For this reason, specific objectives were also considered in terms of how they are stated. The following problems were observed in many departments:

- Some of the specific objectives are vaguely stated. Therefore, the skill or ability that students are expected to acquire upon completion of the course is not clear. For example, in the course description of first year Physics-Technology at BHIE, there is an objective stating that “by the end of the course, students should be able to “communicate their everyday needs and intentions to their teachers and peers in simple but comprehensible English, orally and in writing”. This objective does not describe accurately the skill or ability expected from students once they finish the course. The phrase “everyday needs and intentions” is ambiguous.
- In Physics at UB, one of the specific objectives is formulated as ‘Upon completion of the course, students will be able to master English grammar’. Such an objective is vague because it is not clear what kind of grammar will be dealt with. A possible alternative objective may read as “Upon completion of the course, students will be able to use effectively grammatical constructions commonly found in scientific texts” These constructions are then to be more specified in the learning outcomes of each lesson or unit in a coursebook.
- Some other objectives are too specific. A case in point is the objective stated in First year Biology which is formulated as follows: “Upon completion of the course, students will be able to annotate a diagram.” This objective stated in the form of micro skill would fit for a language focus (language study) of a particular unit or lesson in a coursebook.
- Other objectives are not clearly connected to students’ domain. The objectives stated in 2nd year Physics-Technology and 1st year Maths at BHIE can be given as examples. They are articulated as follows: “[By the end of the course], each student should be able to (1) write and reply to business letters, (2) talk about ability, (3) ask for and give permission, (4) Make an appointment, (5) make a conversation on the phone”. Such objectives are much unlikely to be the primary concern of science students, particularly Maths and Physics students.

- Although grammar was mentioned in the objectives of some classes, it is not clear what grammatical constructions should be emphasised. Therefore, there is a danger that students may be taught grammar which is general and not purposeful.
- The objectives are mainly study-oriented and make no assumption on the language skills science students might need in their prospective profession.

4.2.4.3. Analysis of the Proposed Main Contents

Another aspect considered in the analysis of the English course descriptions concerns the proposed main contents. The analysis of the proposed contents considered the following:

- Whether or not the proposed contents are consistent with the stated objectives
- Whether or not they are connected to students' field of study
- Whether or not the language skill to be learnt from the content can easily be inferred clearly¹⁹
- Whether or not the type of syllabus around which the course is organised is clear.

Table 4.54: Analysis of the Proposed Main Contents of the English Course as Provided in the Programmes of Natural Science Departments

Institution	Field and Level of Study		Are the contents consistent with the stated objectives?	Are the contents connected to students' field of study?	Is the language focus (skill) to be learnt from the contents clearly specified?	Is the type of syllabus clear?
UB	Biology	1st Year	No	Yes, to a small extent	Yes	No
		2 nd Year	No	Yes, to a small extent	Yes, to some extent	No

¹⁹ An item of the contents like "Notion of transparent, opaque and translucent" does not show which language focus to learn from it. In contrast, from an item like "Describe an experiment and its results", it is clear the language students will be taught – how to describe. Therefore, some contents are stated as if they were not language contents but science subjects contents"

	Physics	1st Year	No	No	Yes (grammatical points)	No
		2 nd Year	Yes	Yes, to some extent	Yes (to some extent)	No
BHIE	Bio- chemistry	1st Year	Yes	Yes	To some extent	No
		2 nd Year	Yes, to a small extent	Yes	Yes	No
	Physics- technolog y	1st Year	Yes, to some extent	Yes, to a small extent	Yes	No
		2 nd Year	No	No	No	No
	Maths	1st Year	No	No	No	No
		2 nd Year	yes	Yes	Yes	No
	Geograph y	1st Year	Yes, to some extent	Yes, to some extent	No	No
		2 nd Year	No (contents not clear)	No	To some extent	No

In terms of whether the contents are consistent with the stated objectives, the above table shows that for many classes, the contents do not match the stated objectives. To put it another way, some objectives are just stated but when it comes to the contents, there are no items intended to attain them (the objectives). For example, in Biology department at UB, there is an objective according to which students should be able “to annotate a diagram”. However, there is no content element related to this objective that is proposed in the course description. So, for many classes, there is a mismatch between the stated objectives and the proposed contents. For others classes, the contents are connected to the stated objectives to some extent.

As far as the question of whether the proposed contents are in line with the students’ field of study, in many classes, either there is a mismatch, or the contents relate to the field of study to some extent. In other words, many of the proposed content elements (items) in these classes are not directly related to scientific English.

Regarding the question of whether the language skill to be learned from the contents are clear, it was not clear for some classes. For other classes, the language foci can be inferred to some extent. This means that for some contents, it is not clear what language skill will be dealt with.

Put another way, contents do not guide the teachers as to what language feature to focus on in terms of sub skills and strategies. Such contents seem as if they were intended for teaching science subjects rather than a language.

The last question is about whether the type syllabus around which the course is organised is clear. The analysis of the course descriptions revealed that the contents are not well organized, that is to say that it is hard to see what type of syllabus they are organized around.

4.2. 4.4. References (Text Materials)

References (text materials), were analysed on the basis of the following criteria:

- Whether or not they are suggested in the English course description
- Whether or not they are relatively recent or old²⁰ (in case they are provided),
- Whether or not they reflect Scientific or General English (at least through their title)
- Whether or not they are ready-made or home produced²¹

Table 4.55: Analysis of the Proposed References

Institution	Field and Level of Study		Are references suggested ?	Are they relatively recent or old?	Do they reflect Scientific English or General English	Are they home-produced or ready-made?
	UB					
	Biology	1st Year	Yes	Relatively old	*General English (all)	Ready-made

²⁰ References published between 2000- 2015 were considered as being relatively recent, those before 2000 were considered as relatively old

²¹ That materials are home produced does not necessarily mean that these materials will be developed from scratch. They can be adapted from available coursebooks.

BHIE		2 nd Year	Yes	Relatively recent	*General English (2) *Scientific English (3)	Ready-made
	Physics	1st Year	No	-	-	-
		2 nd Year	No	-	-	-
	Bio-Chemistry	1st Year	Yes	Relatively Old	*General English (2) *Scientific English (3)	Ready-made
		2 nd Year	No	-	-	-
	Physics-Techno	1st Year	No	-	-	-
		2 nd Year	Yes	* Relatively recent (1) *Relatively old (1) *year not specified (1)	*Scientific English (all)	Ready-made
	Maths	1st Year	Yes	* relatively recent (2) *old (2) * year not specified (2)	Scientific English (all)	Ready-made
		2 nd Year	Yes (but just one)	*relatively recent (1) *relatively old (1) * year not specified (1)	Scientific English (all)	Ready-made
	Geography	1st Year	Yes	*relatively recent (1) *relatively old (1)	Scientific English (all)	Ready-made

				* year not specified (1)		
		2 nd Year	Yes			

Regarding the first question, the analysis presented in Table 4.55 above showed that for some classes, there are no references proposed. There is also a case where only one reference was proposed (in 2nd Year, Maths section at BHIE). On the question of whether the proposed references are relatively recent or old, the results given in the same table indicate that a good number of the proposed references were considered as being relatively old. For some references, the date of publication is not even specified. The results also revealed that in most of the cases where references were proposed, they (at least via their titles) reflect scientific English.

It is however not known whether these references are easily accessible and if yes, whether ESP teachers use them or not. It is also worth noting that there is a case (Biology department at UB) where all the proposed references are in line with General English rather than scientific English. Besides, in all the fields where references were proposed, they were all ready-made (in opposition to home-produced or in house-materials), that is, they were available references initially developed for contexts other than Burundi. It is also worth noting that although there were references which reflected scientific English, some were loosely related to students' field of study. For example, the textbook "*Cambridge English for scientists*" is appropriate for all sciences, not particularly to Geography.

Conclusion

This chapter was devoted to the presentation and analysis of the findings. In the first section, the data from the questionnaires (quantitative data) were analysed to identify the needs of the students as were perceived by different stakeholders. The analysis of the questionnaires looked at the different aspects of needs namely (1) attitudes towards learning English, (2) awareness of the status of English language worldwide, (3) the reasons for learning English, (4) the target situations, (5) the important skills and strategies, (6) level of knowledge in the skills and strategies, (7) beliefs and preferences about language learning, (8) views on the strategies to improve the knowledge of English in general, and (9) the appraisal of the current ESP courses. The findings were then compared to see the extent to which the needs differ as perceived by different stakeholders.

In the second section, the data from the interview and existing documentation were considered. The interviews were analysed based on themes. The existing documents analysed were the course description as found in the programs of natural science departments. These course descriptions were analysed in terms of objectives, contents and proposed references. As this chapter only presented the findings, the next chapter is exclusively dedicated to the discussion of the findings of the present study. It is in the next chapter that all the results were merged to answer the research questions and to test the hypotheses formulated at the beginning.

Chapter Five: Discussion of the Findings

Introduction

This chapter discusses the findings of the present study. Therefore, reference to other studies will be made. In this chapter, the results from different instruments were merged to seek answer to the research questions raised in the introductory chapter and to support or refute the hypotheses. The chapter is therefore organised into two sections. The first section discusses the findings for the first and the second research questions. It concurrently considers the first hypothesis of the study. In the second section, the findings for the third research question are discussed and the second hypothesis is tested.

Section 5.1: Discussion of the Findings for the First and Second Research Questions

In this section, the first and the second research questions are addressed concurrently. This is because they are closely linked. The first research question was intended to get a detailed understanding of the Natural Science students' English language needs as perceived by different stakeholders, that is, students themselves, teachers and policymakers. The second research question was put to examine the extent to which the needs differ as perceived by these different partners. The first hypothesis is therefore considered as the discussion proceeds since it is linked to the second research question.

5.1.1. Attitudes towards Learning English Language

The results from the student questionnaire indicated that Natural Science students have an overall positive attitude towards learning the English language. This implies that they would like to learn that language. Scholars such as Dörnyei, Csizér and Németh (2006). Lifrieri, (2005). Oroujlou and Vahedi (2011), Smith (1971), etc. acknowledge the importance of attitude in (foreign) language learning. As Oroujlou and Vahedi argue, having a positive attitude towards learning a language constitutes a good start to learn it. For Lifrieri, 2005, p.14) “a proper and positive attitude is imperative for achievement in language learning”. In line with these scholars, Anthony (2018, p.84), outlining the general principles of language learning, argues that learning is also an emotional process, that is, learners perform better when they see the value of learning, enjoy the learning, feel relaxed and have a positive attitude. It is therefore

essential for ESP teachers to get an idea about the attitudes of their students towards the English language.

The results from teacher's questionnaire revealed also that subject specialist teachers have an overall positive attitude towards learning English. Although both students and subject specialist teachers have a positive attitude, a statistically significant difference was found between the two groups. Put another way, subject specialist teachers have a very positive attitude towards learning English ($M = 4.49$, $SD = .54$) compared with students ($M = 3.80$, $SD = .58$). This means that in terms of their attitudes towards learning English, teachers and students differ to a great extent.

5.1.2. Awareness of the Status of English Language Worldwide

In terms of awareness of the status of the English language, the findings revealed that students are moderately aware that English is a global language used in most of (if not all) domains of life. This lack of full awareness among students is probably attributed to the status the English language has in Burundi. Although it has been declared an official language in the country since 2014, English still does not enjoy effectively such a status (Clément, Constantin & Pierre, 2020). It is indeed French which is the dominant language used in the public and official life of the country (Ntiranyibagira, 2017), as it is mostly used in administration, education, etc. Besides, Burundi is the sole country in the EAC which is officially Francophone. This might cause some students to hold a myopic view of the uses they can make of the English language now or in the future. As far as subject specialist teachers and policymakers are concerned, they are very much aware of the status of the English language worldwide.

A comparison of the three groups revealed that there is a moderate difference among students, teachers and policymakers in their awareness of the global status of the English language. Put explicitly, students are less aware of the status of the English language compared to teachers and teachers, in turn, are less aware than policymakers. A possible explanation of the increased awareness among teachers and policymakers is the fact that most of them have been abroad for studies or other reasons and may have had a chance to use the English language in their studies, professions or occupations.

5.1.3. Reasons for/Importance of Learning English Language

In terms of the reasons for learning the English language, students, teachers and policy makers were given 13 statements representing *instrumental reasons* for learning English as was

presented in Table 4.5, Table 4.27, and Table 4.39. According to Kyriacou and Kobori (1998), ‘Instrumental reasons deal with the uses and benefits that can follow proficiency in a foreign language, such as improved career prospects and access to higher education.’ They hence constitute a major source of motivation.

The results revealed that all the three groups accepted many of the statements as reasons to learn English. Some of these reasons are: (1) “To get access to academic and scientific sources (books) published in English”, (2) “Students may continue their studies abroad at English medium universities”, (3) Because English is a global language of science, (4), “Because students will need English to travel abroad”, (5) “Because English will give them more job opportunities in the East African Community (EAC) and elsewhere”. This indicates that there is great instrumental motivation to learn English among students, teachers and policymakers. These results are in line with Liu’s (2007) study. She investigated Chinese third-year undergraduate non-English major students’ attitudes and motivation towards learning English. In terms of motivation, she found that students had a strong instrumental motivation. The same findings are reported in Al-Tamimi’s and Shuib’s (2009) study which was conducted on Petroleum Engineering students at Hadramout University of Sciences and Technology, Yemen.

To understand whether there was a significant difference in the stakeholders’ perception of the reasons for learning English, a Kruskal-Wallis Test was used. Although the test indicated that the respondents differ to some extent, there was a pronounced tendency of acceptance of these reasons by teachers and policymakers than by students. In fact, while in the student questionnaire only 1 item out of the 13 statements (reasons) scored a percentage of Yes-answer greater than 85%, in the questionnaire for teachers and that for policymakers, the items that obtained a Yes-Answer percentage greater than 80% are respectively 6 and 10. It follows that policymakers strongly accepted these reasons.

A further analysis of the three groups of respondents in terms of their perception of the reasons showed that study- related reasons did not obtain higher percentages of Yes-Answers in the student questionnaire results compared with other statements. This finding is in contrast with the interview (with students) findings. Indeed, the results from the interview with students indicated that the main reason for learning English as were outlined by students are study-related. These interview findings corroborate the results from teachers’ and policymaker’s questionnaires in which study-related reasons obtained a high Yes- Answer percentage.

Besides, the results from interview with ESP teachers and subject specialist teachers emphasised on study-related reasons

5.1.4. Target Situations (Current/ Future)

A look back at Table 4.5, Table 4.28 and Table 4.40 shows that many situations were acknowledged as target situations (current and future) in which science students need to use the English language. As far as current situations are concerned, results from questionnaires and interview revealed that the main situations in which students need to use English are reading for their studies, listening to scientific documentary and searching on the internet for studies. For example, with regard to studies, the interview results indicated that some teachers give notes that are written in English. This is in line with Drubin's & Kellogg's (2012) argument according to which 'by learning a single language, scientists around the world gain access to the vast scientific literature and can communicate with other scientists anywhere in the world'

With regard to future situations, doing a job interview in English, attending conferences in English, prospective work in the EAC, making an online application for a scholarship to study abroad, continuing their studies (masters or doctorate), etc. were highlighted in the questionnaire. The interview findings are consistent with the afore-mentioned situations. Indeed, the results from the different interviews indicated that prospective work in EAC and continuing studies in English-speaking countries were highlighted as major future situations.

To measure whether there was a significant difference in stakeholders' perception of the needs, a Mann Whitney U-test was used. The results showed that the stakeholders differ to a small extent. This means that both students and subject specialist teachers had almost the same views on the target situations in which Natural Science students use/would use the English language they learn at university.

5.1.5. Perception of the Importance of the Main Language Skills and Aspects for Students' Current Studies and Future Career (skills at a macro level)

Both teachers and students acknowledged the importance of the main language skills and aspects (see Table 4.7 and Table 4.29) for students' current studies and future career. The skills of reading, speaking and writing were perceived as the most important for students' studies and prospective job. A comparison of the findings from teachers and students also indicated a small difference in students' and teachers' perception of the importance of the main language skills

and aspects. However, teachers tended to perceive the skills more important than students. Indeed, many of the items were perceived by teachers as very important.

To the question of what skill or aspect students need the most, the answer is different between students and teachers. Students perceived speaking as the skill they need the most. This finding is in contrast with Linde López's (1997) Needs Analysis study conducted at the University of Granada in Spain in which students reported overwhelmingly that their first urgent need was to know how to read texts and articles adequately. The finding (of the present study) is also inconsistent with what might be expected from science students in the Burundi context. Indeed, as most of scientific literature is published in English, such students would be expected to know how to read it. The necessity of reading skills was also reported in Rahman' (2012) study. His study was conducted on 50 undergraduate computer science students at Putra University in Malaysia. Most of the participants recognized the importance of reading skills for academic purposes such as reading textbooks/reference books, technical journal articles, research reports, magazines articles, etc.

The findings from Linde López (1997) and Rahman (2012) are in line with teachers' beliefs in the present study. They perceived reading as the skill that science students need the most. The teachers' perception corroborates the findings reported previously in the present study according to which reading for studies and searching on internet for studies are the main target situations in which science students need to use English. It is worth mentioning that technical (scientific) vocabulary was highlighted by both teachers and students as the second most needed skill. Such a finding was also reported by Rahman (2012).

The findings from the interview indicated that speaking skill is again put forward by students. They indeed displayed a strong preference for activities engaging them in practicing speaking skill such as presentations. A possible reason why students put forward the speaking skill is that it is the skills they are the least exposed to in the English language. Another possible explanation to this preference for speaking over reading is that students are likely to have a superficial view of what is reading, limiting this skill simply to being able to identify the graphical symbols printed on paper or displayed on the screen. With such a myopic view, students consider themselves as being able to read and will therefore regard this as not being the most needed skill. On the contrary, teachers indicated the need to consider the language as a whole that is focussing on all the main language skills and aspects. Yet they put special emphasis on vocabulary related to students' field of study.

5.1.6. Perception of the Importance of Sub-skills and Strategies (skills at a micro level)

In terms of sub-skills and strategies, all the four types of sub-skill and strategy were acknowledged by students and teachers as being important. However, a comparison of the results from students' and teachers' questionnaires revealed that teachers tended to view the sub-skills and strategies as being more important than students did. Indeed, except for listening sub-skills and strategies, a significant difference was found between teachers and students for the other three types.

5.1.7. Students' Level of Knowledge of the Sub-skills and Strategies (hence their difficulties)

In order to identify where students have difficulties, they were asked to self-evaluate their level of knowledge of speaking, reading, writing and listening sub-skills and strategies. The results indicated that students claimed to have an average knowledge in speaking, writing and listening and a good knowledge in reading. However, in the interviews with students and teachers, it was reported that students have difficulties in reading for their studies, reading loudly (difficulty in pronunciation), in speaking, in listening, and the lack of motivation. Similar findings were reported by Hattani (2019), Mestari and Danial (2018), Mihalache (2015), Akyel and Ozek (2010).

5.1.8. Beliefs and Preferences Regarding Language Learning

In this study, the researcher also investigated the stakeholders' beliefs and preferences in terms of, activities, methodology and materials. With regard to activities, the results from the questionnaires indicated that both teachers and students are neutral on whether students would learn better if activities are set in groups. However, the interview findings revealed that both students and teachers support group activities. The major reason they provided for the support of group activities is that with group activities, students can help each other, that is, good students can help weak ones. It is notable that the participants insisted that the groups should not be large. The British Council outlined a number of advantages of pair work or small group work. Some of these advantages are (1) learners get more time to speak, (2) the place of the lesson changes, (3) learners get sense of achievement when reaching a team goal, etc. It is worth mentioning that the use of both individual and group activities was also supported by both

teachers and students. Teachers and students believed that students should be given the opportunity to practice role-plays and share ideas and experience.

Concerning whether the use of audio-visual materials would help students learn better the English language, the results from questionnaire indicated a neutral position of both teachers and students. However, the analysis of the interview data showed that both students and teachers support the use of these materials. One of the explanations they provided is that such materials can help in situations where there is lack of materials in the laboratory. In fact, educational videos can be used to show how an experiment is conducted in a laboratory. The importance of the audio-visual materials is acknowledged in the literature on language learning. They are well-known in that they greatly help in stimulating and facilitating the learning of a foreign language (Cakir, I. (2006). Taken as example, video, or audio-visual material, is liked in that it 'brings the real world into the classroom, contextualizes language naturally and enables learners to experience authentic language in a controlled environment' (ibid, p.68).

In terms of methods, both teachers and students believe that ESP teachers should provide students with an opportunity to practice role-plays and share ideas, opinions and experiences. This finding is consistent with the interview results which revealed that both students and subject specialist teachers would like their teachers not to speak alone but provide students with time to speak or do practical activities which will foster the participation of each student.

It can be seen that both students and subject specialist teachers would like ESP teachers to use activities that will engage students to learn actively such as simulations, problem-solving exercises, etc. According to McKeachie (1999, p.44, as cited in McCarthy, & Anderson, 2000), active learning refers to "experiences in which students are thinking about the subject matter" as they interact with the instructor and each other. It is opposed to traditional techniques which consider learners as passive. In fact, unlike traditional methods which facilitate the memorization of large quantities of information, active learning-based activities stimulate inquiry and interest as students acquire knowledge. ESP teacher therefore takes the position of facilitators or guide rather than knower of everything.

A comparison of the findings from teachers and students indicated a statistically significant difference in their beliefs about and preferences in language learning. Teachers have stronger beliefs about language learning than students

5.1.9. Views on the Strategies to Improve English Knowledge Overall

Both students and subject specialist teachers were asked in the questionnaires to give their views on the strategies that can be used to improve the knowledge of English overall. Such strategies are namely (1) reading any English text that is interesting to the student, (2) watching television in English, (3) watching movies in English, (4) listening to native speakers on the radio, (5) revising regularly the English course, (6) doing homework (7) visiting web sites that are in English. Both students and teachers viewed them as very helpful to students in improving the students 'overall knowledge in English. Thus, a comparison of the results from these respondents showed no statistically significant difference.

These strategies would help students to continue learning informally, that is outside the classroom. Such strategies foster independent language leaning also called self-study or learner autonomy which, as reported in Balçıkanlı (2010), is understood as being able to work alone, knowing how to study well on one's own.

Section 5.2. Discussion of the Findings for the Third Research Question

This section addresses the third research question of the present study and therefore considers the second hypothesis. It seems essential to remind the reader about the third research question and the second hypothesis. The third research question was intended to evaluate the extent to which the current ESP courses taught to Natural Science students respond to their specific needs. This question is linked to the second hypothesis which states that there is a discrepancy between the current ESP courses taught in Natural Science departments in Burundi and the English language needs of Natural Science students.

The discussion in this section is organized in three stages. In the first stage, the discussion focusses on the stakeholders' feedback on the course as obtained from the questionnaire and interview results. In the second stage, the discussion is centered on the findings obtained from the analysis of existing documentation. The last stage addresses the third research question and considers the second hypothesis by drawing on the discussion in the previous stages and section one of chapter five.

Stage 1: Stakeholders' Evaluation of the ESP Course

To see whether the course has helped students to improve their overall knowledge of English, they were asked to self-assess their knowledge at the start of their university studies and at the end of the English course in the second year. The results indicated that their knowledge remained fair. However, there has been a small improvement as the mean score shifted from 2.91 to 3.41. This means that the course helped students to some extent. Similarly, in terms of main language skills (reading, writing, listening and speaking) and aspects (grammar, vocabulary, pronunciation), the results from the questionnaire indicated that the course helped students to some extent.

Even though students reported that the course helped them to some extent, they acknowledged that ESP teachers rarely/or never use the traditional method, but give an opportunity to actively participate in the classroom through activities involving role-plays, paired discussion and group discussion.

In terms of the contents, audio-visual materials and activities of the ESP courses, students are fairly satisfied. Indeed, although they agreed that the texts used by ESP teachers are relevant to students' field of study; they reported that the contents fairly reflect real life use of English in scientific situations. Besides, they are fairly satisfied with the appropriateness of the materials and the range of topics covered in the course.

These findings are consistent with the ones obtained from interviews with students. In interview, students' dissatisfaction with the ESP course lies in that, as they reported, the course is given less attention (it is less valued), and that there is lack of materials like an official fixed²² coursebook. This lack of a fixed coursebook has a great impact on the teaching of ESP. Indeed, different scholars have emphasised the advantages of having a coursebook in language teaching (eg, Richards, 2014 ; Ur 1997, Tomlinson, 2011, etc.). Such advantages are summarized in the following:

²² By "fixed" we mean an official coursebook designed for students in a particular discipline (say, Maths) but which will be used even at different higher education institutions across the country. Such coursebook would be subject to validation by the Ministry of Education

- A coursebook is regarded as resource to achieve aims and objectives that were set before in terms of learner needs.
- Coursebooks often serve as a syllabus. It is worth reminding that a syllabus is used here to refer to, as Ur (1997, p.176) explains, a document – consisting essentially of a list – which specifies all the things that are to be taught in the course. It has therefore to be comprehensive and ordered (contents or items should be logically sequenced). As Richards (2001) argues, without textbooks, a program may have no central core and learners may not receive a syllabus that has been systematically planned and developed.
- A coursebook is a kind of a road map. Indeed, it can help both teachers and students to easily check whether or not they are progressing as planned. In other words, as Ur (1997) argues, it offers a good framework as teachers and students will know where they are and what is coming next and will therefore feel a sense of structure and progress. This will provide coherence to individuals lessons (classes) and to the entire course as well.
- Richards (2014) also explains that a textbook can provide students with a sense of independence, which cannot be achieved by reliance on daily or weekly teacher-prepared lesson handouts. This independence or autonomy is also well explained by Ur (1997). He states that a student can use a coursebook to learn new materials, review and monitor progress with some degree of autonomy. Thus, without a coursebook, students are more teacher-dependent.
- Finally, a (fixed) coursebook can also help maintain consistency of the course across the same disciplines. This is possible if teachers use the same coursebook across the same fields of study.

Another dissatisfaction voiced by students in the interview is that the ESP course is taught by language teachers instead of science teachers. They claim that a general English teacher would find it difficult to teach scientific English. This claim is, however, challenged by many scholars (e.g. Akermark, 1983; Hutchinson & Waters, 1987; Mohammed, 2012, etc.). These scholars explain that the task of an ESP teacher is not to teach the content or subject matter, but rather to teach the language. The reason is that language teaching is a kind of science requiring the use of specific knowledge and application of specific principles.

As far as the time allocated to the ESP course is concerned, all the stakeholders (students, teachers, and policymakers) strongly agreed that the time is not enough and recommended that

it should be increased. It is worth reminding some of the explanations that students provided for their dissatisfaction with the time allocated to the course:

- Students learn a few things and it is just to validate the course – getting the average mark required to pass the course.
- The teacher runs with time (hasten things) and students do not understand. This implies that not many aspects are covered in the course.
- The time for activities is limited; the ESP teacher cannot give as many activities as necessary

Stage2: Discussion of the Findings from Existing Documentation

The documents that were analysed are the English course descriptions as found in the curricula of Natural Science departments (*offres de formation* in French). These are like course plans which are initially established for accreditation purposes (accreditation by the National Commission for Higher Education). The course descriptions as given in the department's programmes provide information on different aspects. In the present study, attention was put on the following aspects: (1) the general objective(s) or aim(s) of the course, (2) specific objectives, (3) proposed contents, and (4) suggested references. It is worth recalling that in most classes, the English course has vague or generic names like English I, English II or General English.

In terms of general objectives (goals or aims), there are not spelt out in some departments. Perhaps it may have been taken for granted that the aim of the course is « to teach English » which is vague as it does not provide any guidelines for teachers, students, and/or materials writers. This is a problem because stating goals is of great importance as emphasised by Graves and Xu (2000). They argue that stating the goals helps to bring into focus the visions and priorities for the course.

In other departments, the general objectives are given but are poorly stated and are not clearly connected to students' field of study. A possible explanation for this is that they were stated based on intuition rather than a formal comprehensive needs analysis. Indeed, it is need analysis that provides a basis for specifying goals and objectives for a learning programme (Nunan, 2001).

Regarding specific objectives, none of the four macro-skills is referred to in some classes and in some others only one skill is mentioned. Perhaps it is because these skills are taken for granted as no Needs Analysis was conducted. Besides, in almost all-Natural Science departments, the macro-skill of listening is not evoked. It is notable however that some of these skills are just mentioned in the specific objectives but not actually taught as they are not reflected in the proposed contents of the course.

As far as the contents of the courses were concerned, in many classes, they do not correspond to the stated objectives and many of the proposed contents do not reflect directly scientific English. It is also worth mentioning that in all classes, it is not clear which type of syllabus the course is organised around. Logical sequencing of contents should be determined as it will help decide on which content is needed earlier in the course and which will provide a foundation for things that students will learn later (Richards, 2001).

Regarding the references, in some classes, they are not even suggested. In others, it is just one reference that is given. In classes where references were proposed, some of them are not connected to scientific English, and are relatively old. Besides, they were all ready-made, that is, available references initially develop for contexts other than Burundi. The problem with ready-made textbooks is that most of the time they do not cater for the local realities and are often beyond the level of the students. In fact, they are produced for the global market as they are not written for learners from a particular culture or country but are intended for use by any class of learners of a specified level and age group anywhere in the world. (Tomlinson, 2011).

Cummingsworth (1995, p. 136) also explains the problem with ready-made textbook. He insists that despite a range and variety of published material on the market, it is rare to find a perfect fit between learner needs and course requirements on the one hand and what the coursebook contains on the other hand. The reason is that every learning/teaching situation is unique as it depends on factors such as the dynamics of the classroom, the personalities involved, and the availability of resources, expectations and motivation of the learners.

Thus, tailor-made coursebooks for Natural Science departments in Burundi can be developed basing on the adaptation of available commercial coursebooks. The adaptation of a coursebook involves making changes that may take forms including (1) modifying content, adding or deleting contents, reorganizing contents – changing the sequence of contents, modifying tasks,

etc. (Nation & Macalister, 2010; Richards, 2001). The result is a home-made coursebook that would demonstrate more local relevance to learners' needs than available materials.

Stage 3: Considerations on the Third Research Question and the Second Hypothesis

The discussion in the first stage (see above) addressed the third research question. In fact, students reported that the course responded to their needs to some extent. The second stage reinforced such a finding by highlighting the shortcomings of the ESP courses in terms of objectives, contents and proposed references through the analysis of existing documentation. A concurrent consideration of the discussion in stage 1 and stage 2 and a look back at the identified needs of the students as discussed in the previous section of chapter five helped shed the light on discrepancies between the current ESP courses and the students' English language needs. These discrepancies are summarized below:

1. The time allocated to the English course is 30 hours in first year and 30 hours in second year. However, students, teachers and policymakers all insisted that this time is short for students to develop all the necessary skills in English language in science departments. This is emphasized in the interview results where students reported that the course is given less attention and teachers recommended that the course be given an important place in the programmes of natural science departments.
2. Whereas all the 4 macro-skills were perceived as important, some classes do not mention any of them in their objectives. Besides, there is no explicit teaching of the necessary subskills and strategies which would correspond to the identified target situation (examples of such skills are: making a presentation in English, skimming, scanning, making an online application for a scholarship).
3. Although students need to be taught scientific English related to their specific field of study, for many of the classes, some of the objectives and most of the proposed content elements do not directly reflect scientific English. They are rather suitable for general English courses.
4. Although students and teachers acknowledged the importance of developing the sub-skills (micro-skills) and strategies related to the 4 macro-skills, some specific objectives are vaguely (poorly) stated and cannot therefore guide the teachers as to what language feature to focus on in terms of sub-skills and strategies.

5. Both students and teachers supported the use of audio-visual materials such as short films, documentary, educational lab-video, etc. However, only text references (resources) are suggested to ESP teachers. What is more, some of these text references do not reflect scientific English. Others are relatively old and were developed for students in contexts other than Burundi. On top of that, most of the suggested science English-related references are not available in the University of Burundi library collective catalogue, hence a difficulty to teachers and students to access them.
6. According to students, the macro-skill they mostly need to develop is speaking skill. However, in some classes, it is not clear which skill should be given much attention. Besides, where speaking appeared to be emphasised, it is not clear sometimes what sub-skills will be involved. At other times, it is equated with few micro-skills which are sometimes not even related to scientific English
7. Students recognised the importance of grammar. Yet, in the ESP course proposed in the department programmes, these problems were observed: (1) in some classes, such a language aspect is not even referred to in the objectives of the course (in Biology department at UB for example), (1) where there is reference to grammar, most of the time, it is not clear which grammatical constructions will be dealt with. (3) At other times, the grammatical constructions proposed are general and not purposeful.
8. Technical (or scientific) vocabulary was perceived by both teachers and students as the second most needed language aspect for science students. Nonetheless, in many of the classes, it is not referred to in the specific objectives of the course (Example in Maths section at ENS).
9. Both students and teachers accepted profession/vocation-related situations such as (1) doing a job interview in English, (2) attending conferences in English, working in EAC, (3) working in a multinational company or institution, etc. as prospective target situations in which science students will use the English language. However, the objectives of the English course taught in science departments make no reference to language skills that might help students in their future profession (vocation).

Given all the above discrepancies, it can be concluded that that the current ESP courses do not respond to the needs of the students to a great extent. The second hypothesis is hence confirmed.

Conclusion

This chapter discussed the findings of the present study. In this chapter, the quantitative and qualitative data were merged to answer the research questions and to confirm or refute the hypotheses formulated earlier.

The first section of this chapter addressed concurrently the first and the second research questions and considered the first hypothesis. With regard to the first research question, the results indicated that respondents had an overall positive attitude towards learning English and were instrumentally motivated to learn the language. The findings also highlighted the different target situations in which Natural Science students use/would use the English language. Although the importance of the skills and strategies was recognized by the respondents, the findings indicated that students had difficulties in reading, pronunciation, speaking, listening and writing. The merged results indicated also preference for group activities, role-play and audio-visual materials.

Regarding the second research question and the first hypothesis, the analysis of the findings showed that the participants' perceptions of the needs differ to a small extent in terms of target situations, importance of the language skills and the general strategies for learning English. In terms of attitudes towards English and beliefs about language learning, the participants differ to a great extent. Regarding the awareness of the status of the English language worldwide and the reasons for learning English, the respondents differ to some extent.

The second section of the chapter addressed the third research question and considers the second hypothesis. The merged findings indicated that students were fairly satisfied with the ESP course. They reported that the course helped them to some extent. A consideration of findings from questionnaires, interviews and existing documentation helped to shed the light on the discrepancies between the current ESP courses and the students' English language needs and hence support the second hypothesis. In the next chapter, the researcher proceeds with the summary, general conclusions and recommendations.

Chapter Six: Summary, General Conclusions and Recommendations

This final chapter of the study provides the summary and conclusions drawn from the findings. It also presents the recommendations formulated to different stakeholders for improving the teaching/learning of ESP courses in non-linguistic departments especially Natural Science departments. Suggestions for future researchers are also made.

6.1. Summary and Conclusions

This study set out with the primary aim of improving the teaching of English in departments other than languages particularly in Natural Science departments through Needs Analysis. In Burundi higher education, although the English language is taught in all non-linguistic departments, there is still an unfamiliarity with the practice of Needs Analysis. Thus, in the design of ESP courses, students are not consulted at any stage of the course development. These courses are therefore based on designers' intuition or personal experience.

In an attempt to bridge this gap, this study was specifically carried out to identify and analyse the English language needs of natural science students at the University of Burundi and BHIE and then examine the extent to which these needs differ as perceived by different stakeholders. It also investigated the extent to which the current ESP courses taught in natural science departments respond to the specific needs of the students.

To attain these specific objectives, the following research questions were asked: (1) What are the English language needs of Natural Science students at two main public higher education institutions in Burundi? (2) To what extent do the needs differ as perceived by students, teachers and policymakers? (3) To what extent do the current ESP courses taught in Natural Science departments respond to specific needs of the students?

In order to find answers to these questions, the study drew on the pragmatic research paradigm according to which, a researcher emphasizes on the research problem and questions and makes use of all available approaches to understand the problem. Thus, this study adopted a mixed-methods research design. In other words, the researcher collected both quantitative and qualitative data from different sources of information and by means of different instruments.

Indeed, the data were collected from students, teachers and policymakers by means of a questionnaire, interview and consultation of existing documentation.

The quantitative data were coded and processed using a statistical data analysis tool (IBM SPSS version 22). They were then analysed by means of descriptive and inferential statistics. The interviews data were first coded and then analysed based on themes. They were analysed by means of a qualitative data analysis software (Weft QDA). The results from questionnaires and interviews were completed by the analysis of existing documentation and were merged in the section on the discussion of the findings to answer the research questions. The following are the major finding for each research question.

6.1.1. Major Findings for the First and the Second Research Questions: The Needs of the Students and how they Differ

1. Natural Science students displayed an overall positive attitude towards learning. A comparison of students' attitude to that of subject specialist teachers revealed that there was a statistically significant difference between the two groups. In other words, subject specialist teachers showed a more positive attitude towards learning English than students.
2. Although students had a positive attitude towards learning English, they still had a moderate awareness that English is a global language. On the contrary, teachers and policymakers were very much aware of the status of English language worldwide. A comparison between the three groups revealed a moderate difference in their awareness of the global status of the English language. The descriptive statistics showed there was a difference. Students were less aware of the status of the English language compared to teachers and teachers, in turn, were less aware than policymakers.
3. Many reasons for learning English were accepted by students, teachers and policymakers. Besides, the results from the questionnaires and interview showed that study-related reasons were emphasized. The acceptance of these reasons indicates that there is great instrumental motivation to learn English among students, teachers and policymakers. A comparison of the findings from the three groups of respondents showed that teachers and policymakers displayed greater acceptance of the reasons than students.

4. Regarding the target situations, both students and teachers accepted them. The target situations such as (1) reading for studies, (2) searching on the internet for studies, (3) pursuing studies in English-speaking countries and (4) prospective work in EAC were highlighted as the major target situations in which students (need to) use English language. A comparison between teachers and students revealed that the respondents differ to a small extent in their perception of the target situations.
5. As far as the importance of the main language skills and aspects for students' studies and prospective job occupation, both teachers and students acknowledged their importance. Thus, a comparison of the two groups indicated that they differ to a small extent in their perception of the importance of the main language skills and strategies. However, teachers tended to perceive the skills as more important than students. Among the main language skills and aspects, students perceived speaking as the skill they need the most. Teachers however highlighted the need to focus on the language as a whole by paying special attention to reading skill and technical vocabulary. In terms of sub-skills and strategies, all the four types of sub-skills and strategies were acknowledged by students and teachers as being important.
6. Students' self-evaluation indicated that they have an average level of knowledge in speaking, writing and listening and good knowledge in reading. Yet, the interview with students and ESP teachers revealed the opposite. In fact, it was reported that students have difficulties in reading for their studies, reading aloud (difficulty in pronunciation), in speaking, in listening, and the lack of motivation.
7. In terms of beliefs and preferences regarding activities, materials and methodology, the findings indicated that group activities were preferred. Similarly, audio-visual materials were believed to help students in learning English in that they can, for example, be used to show experiments that are conducted in labs. Furthermore, both students and teachers support the use of active learning/teaching methods that would engage each student to participate. This is opposed to traditional techniques which consider learners as being passive. Therefore, ESP teachers were recommended to not speak alone but give students time to speak and do practical activities. A comparison between teachers and students showed that they differ to a great extent in their beliefs and preferences for learning English. Teachers have stronger beliefs about language learning than students

8. General strategies such as (1) reading any English text that is interesting to the student, (2) watching television in English, (3) watching movies in English, etc. were viewed as helpful to students in improving their knowledge of English language in general. A comparison of the findings revealed no significant difference. In other words, these strategies were highly accepted by both students and teachers.

6.1.2. Major Findings for the Third Research Question: The Extent to which the Current ESP Courses Respond to the Needs

Overall, students reported that the English course helped them to some extent. This means that their knowledge of the main skills (reading, writing, listening and speaking) and aspects (grammar, vocabulary, pronunciation) improved to some extent.

In terms of the contents of the English course, students were fairly satisfied, since these contents fairly reflect real life uses of English in scientific situations. Similarly, students were fairly satisfied with the appropriateness of the materials and the range of topics covered in the course.

Concerning the time allocated to the English course in non-linguistic departments, all the stakeholders (students, teachers, and policymakers) strongly agreed that the time is not enough and recommended that it should be increased.

An analysis of existing documentation showed the major shortcomings of the current ESP courses. These shortcomings were highlighted in terms of objectives, contents and suggested references. Some of these shortcomings are that (1) the objectives in some departments are vaguely stated or are too specific. (2) In many Natural Science departments, the contents are not consistent with the stated objectives, that is, there is a mismatch between the stated objectives and the proposed contents. Besides, many of the proposed contents are not directly related to scientific English. (3) In terms of proposed references, they were relatively old, and in some departments (eg Biology at UB), the proposed references are in line with General English rather than scientific English. It is also worth noting that in departments where references were proposed, they were all ready-made (in opposition to home-produced or in-house materials) and therefore may not care for the local realities and are often beyond the level of students.

A concurrent consideration of the students' evaluation of the current ESP courses and the analysis of existing documentation showed that there is a mismatch between the identified

needs of Natural Science students and the existing ESP courses in many respects. This led the researcher to the confirmation of the second hypothesis.

6.2. Recommendations

Based on the findings of the present study, recommendations are formulated for promoting the teaching/learning of English and for future researchers.

6.2.1 Recommendations for Improving the ESP Courses in Natural Science Departments

In order to promote the teaching/learning of English language in non-linguistic departments in general and Natural Science Departments in particular, the researcher generally recommends a Needs Analysis-based redesign of the ESP courses in those departments. For the courses to be successful, different stakeholders namely ESP course designers, teachers, students and policymakers have to be involved.

6.2.1.1. Specific Recommendations

(i) To (potential) ESP course designers:

It is recommended to design an official fixed ESP coursebook which would respond to the particular needs of Burundi science students. Such a coursebook would comprehensively cover the language patterns and skills directly relevant to the needs of the students. This will spare ESP teachers the heavy reliance on daily prepared notes which in most cases compromise the integrity of the course. To show how the coursebook can be designed, a sample syllabus (see Appendix 1) and a sample unit (see Appendix 2) were tentatively suggested for Biology students.

(ii) To ESP teachers:

ESP teachers are recommended to:

- Deal with the four main language skills with a special attention put on reading and speaking for academic purposes.
- Focus on language structures, vocabulary and functions that are purposeful and derived from authentic written and/or spoken texts. Put another way, the structures and lexis

should not be taught as an end in themselves. They should be of practical usefulness in the students' field of study.

- Use activities that engage students to actively participate in the course like simulations and role plays.
- Use audio-visual materials to help bring the real situations in the classroom. It is worth mentioning that such materials are still neglected in the Burundi ESP context.
- Raise students' awareness of the worldwide use of English in science and research.

6.2.1.2. General Recommendations

(i)To policymakers:

- (1) It is recommended that the time students get exposed to the English language in non-linguistic departments be increased. This can be realized in three ways. First, the time of exposure to the English language can be increased by some hours in each class (for example, from 30h to 60h). Second, the time can be increased if the ESP course is taught at all levels of undergraduate studies (from first year to third year). Finally, by teaching some science courses in English, the time of exposure to the English language will increase as students will have to learn some science courses using English. This can be introduced in second or third year after students have acquired some competence in scientific English.
- (2) A second recommendation addressed to policymakers is the creation of a coordination board for ESP courses. Such a board would include both language teachers and science teachers. It would contribute a lot in developing ESP courses, that is, from Needs Analysis to syllabus design and to material production (in-house materials especially in form of coursebooks).
- (3) A third recommendation addressed to policymakers is the creation of English clubs in science departments. These clubs should be supported to be highly beneficial to students.

(ii)To students:

Because they are learning English in a foreign language context, opportunities to practice speaking are rare. To overcome this challenge, it is recommended that students join or establish English clubs and use different strategies to keep up learning independently of the teacher. This is because even once the course is redesigned, it is unlikely that students will acquire all they need in the language. Besides, learning is a lifelong process.

6.2.2. Recommendations for Further Research

1. This study recommends a needs analysis- based redesign of the ESP courses taught in Natural Science departments through a development of a textbook appropriate for the Burundi context. Once the course is redesigned, further studies would be needed to assess its adequacy and effectiveness.
2. This study was undertaken at the undergraduate level. Further studies could then be conducted to analyse the English language needs of Natural science Students at the postgraduate level.
3. Since the English language course is now taught in all non-linguistic departments, comprehensive needs analysis studies could be extended to other disciplines.

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Appendices

Appendix 1: Sample Syllabus (for Biology students)

SN	Units	Reading and vocabulary building	Language study	Listening and Pronunciation	Writing skills	Speaking practice
1	Properties of Life	-Pre-reading vocabulary - Vocabulary extension - Dealing with unknown words	-Adjectives -Reference words	-Pronunciation practice (technical words) -Listening for specific information	-Writing a simple definition	-Explaining the characteristics of something
2	The process of science	-Pre-reading vocabulary -Vocabulary extension -Reading for details	-Sequence markers	Listening to a lecture “ The Scientific Method ”	Writing a process paragraph	Describing a process orally
3	The chemistry of life					
4	Classification of Living things					
5	The Body's Systems					
6	Etc.					

Appendix 2: Sample Unit (for Biology Students)

UNIT 1

PROPERTIES OF LIFE

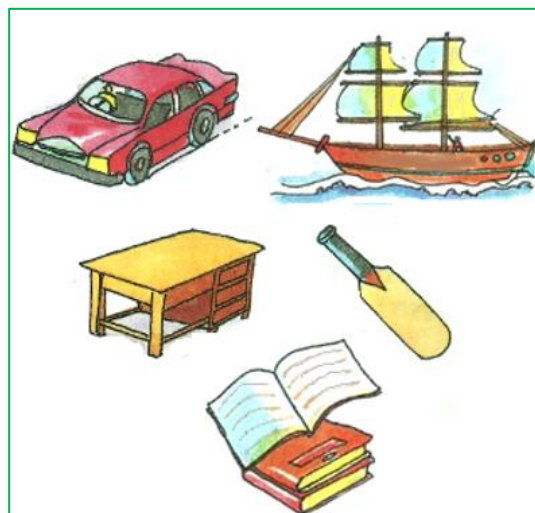
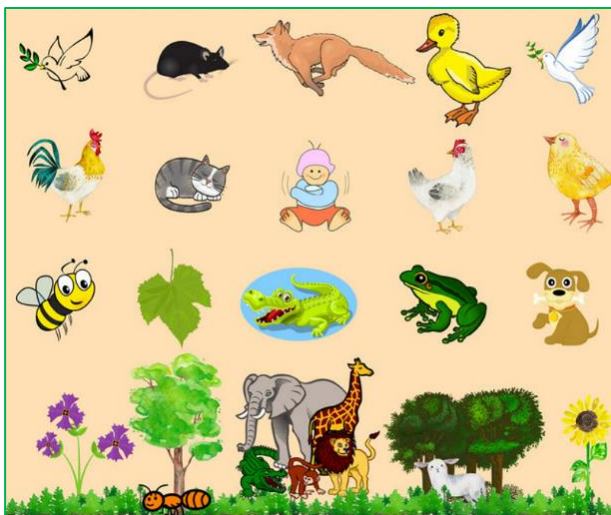
By the end of this unit, you will be able to:

- Work out the meaning of unknown words
- Use reference words to avoid repetition in sentences
- Listen for specific information
- Write a simple definition



Start-up

Task1. Observe the two pictures below and discuss with your partner. What is the main difference between the things in the picture on your left and the picture on your right?



Task 2. Discuss the common characteristics of the things in the picture on your left.

1

Reading skill and vocabulary building

Pre-reading vocabulary

Task 3: Match each word in column A with its definition in column B

A		B	
1	cell	a	an organism that is made of one cell
2	organelle	b	Passing down traits from parent to child, generation after generation.
3	single-celled	c	basic substances which are used in or produced by a reaction involving changes to atoms or molecules
4	digestive system	d	A change in an organism's environment that affects the activity of the organism
5	fossil	e	A reaction of a living thing to stimulus
6	heredity	f	substances found in food that provide the energy or structural materials required for normal growth, maintenance, and repair of the body.
7	molecule	g	the smallest part of a living thing that retains all the properties of life
8	DNA (deoxyribonucleic acid)	h	an individual living entity
9	nutrient	i	a bone or a shell or the shape of a plant or animal which has been preserved in rock for a very long period
10	offspring	j	a chemical structure consisting of at least two atoms held together by a chemical bond.
11	response	k	a structure within a cell that carries out specific function
12	chemicals	l	a chemical molecule that carries hereditary material
13	organisms	m	The young of an animal or a person's children
14	stimulus	n	takes up nutrients and water and eliminates wastes

Reading text: Properties of Life

In its broadest sense, *biology is the study of living things—the science of life*. Living things come in an astounding variety of shapes and forms, and biologists study life in many different ways. They live with gorillas, collect **fossils**, and listen to birds. They isolate viruses, grow mushrooms, and examine the structure of fruit flies. They read the messages encoded in the long **molecules** of and count how many times a hummingbird's wings beat each second. But, what exactly is life? What makes something "alive"? Anyone could deduce that a walking cow is alive and a car is not, but *why*? We cannot say, "If a car moves, it's alive," So, What characteristics *do* define life?

The following are the basic characteristics that all living organisms share:

1. Order. All **Organisms** are highly organised structures that consist of one or more cells. Even very simple, **single-celled** organisms are remarkably complex. Inside each cell, atoms make up molecules. These in turn make up cell components or **organelles**. Multicellular organisms, which may consist of millions of individual cells, have an advantage over single-celled organisms in that their cells can be specialized to perform specific functions, and even sacrificed in certain situations for the good of the organism as a whole.

2. Sensitivity or Response to Stimuli.

Organisms respond to diverse stimuli. For example, plants can bend toward a source of light or respond to touch. Even tiny bacteria can move toward or away from chemicals (a process called chemotaxis) or light (phototaxis). Movement toward a **stimulus** is considered a positive response, while movement away from a stimulus is considered a negative response.

3. Reproduction. Single-celled organisms reproduce by first duplicating their **DNA**, which is the genetic material, and then dividing it equally as the cell prepares to divide to form two new cells. Many multicellular organisms (those made up of more than one cell) produce specialized reproductive cells that will form new individuals. When reproduction occurs, DNA containing genes is passed along to an organism's **offspring**. These genes are the reason that the offspring will belong to the same species and will have characteristics similar to the parent, such as colour and blood type.

4. Growth and Development: Organisms grow and develop according to specific instructions coded for by their genes. These genes provide instructions that will direct cellular growth and development, ensuring that a species' young will grow up to exhibit

many of the same characteristics as its parents.

5. Regulation. All organisms, even the smallest ones, are complex and therefore have multiple regulatory mechanisms to coordinate internal functions, such as the transport of **nutrients**, response to **stimuli**, and many others. For example, organ systems such as the **digestive** or circulatory systems perform specific functions like carrying oxygen throughout the body, removing wastes, delivering nutrients to every cell, and cooling the body.

6. Homeostasis. To function properly, cells require appropriate conditions such as proper temperature, pH, and concentrations of diverse **chemicals**. These conditions may, however, change from one moment to the next. Organisms are able to maintain internal conditions within a narrow range

almost constantly, despite environmental changes, through a process called **homeostasis** or “steady state”—the ability of an organism to maintain constant internal conditions. For example, many organisms regulate their body temperature in a process known as thermoregulation. Organisms that live in cold climates, such as the polar bear, have body structures that help them withstand low temperatures and conserve body heat. In hot climates, organisms have methods (such as in humans or panting in dogs) that help them to shed excess body heat.

7. Energy Processing. All organisms use a source of energy for their metabolic activities. Some organisms capture energy from the sun and convert it into chemical energy in food; others use chemical energy from molecules they take in

Vocabulary Extension

Task 4: Read and complete each of the following sentence with one of the words from the box.

Cells	organelle	single-celled	nutrients	offspring	organisms
stimuli	DNA				

1. A plant, an animal, a virus, a person are all_____.
2. Most animals or plants consist of billions or trillions of _____.
3. The digestive systems transforms the raw materials of our food into _____ and energy that keep us alive.
4. Animals and their _____ have similar characteristics that they share.
5. A cell consists of different components called _____.
6. A plant, an animal, a virus, a person responds all to _____.

7. Bacteria are examples of _____ organisms
8. During reproduction, _____ is passed down from parent to child.

Dealing with unknown words while reading

While reading, you may come to words which are not familiar to you. One way to deal with these difficult words is to look up them in a dictionary. But you cannot use a dictionary all the time. Here are the techniques you can use to deal with unknown vocabulary:

1. Decide first whether it is really necessary to understand the word. You may need to ignore the word because you can understand enough of the text without understanding the word.
2. Identify the word class. Each word belongs to a particular word class such as *noun*, *verb*, *adjective*. These are often referred to as *parts of speech*. Identifying the word class can help you work out the meaning of a particular word.
3. Use the structural analysis to determine the meaning of the word, that is, breaking down the word into parts to discover its meaning. You should pay attention to the prefixes and suffixes.

For example, consider the following sentences:

- a. **Multicellular** organisms, which may consist of millions of individual cells, have an advantage over single-celled organisms in that their cells can be specialized to perform specific functions.
- b. What makes biology so great is that it allows you to explore the **interconnectedness** of the world's organisms.

Note:

- ✓ Multicellular= multi (which means many) + cellular
 - ✓ Interconnectedness = inter (which means between) + connected + ness (which indicates that the word is a noun)
4. Try to guess the meaning of the word from context (by referring to the surrounding words or sentences). To make out the meaning of a word from context, you can do the following:
 - a. Check for the definition or explanation of the word in the sentence.

e. g1.: *Single-celled organisms reproduce by first duplicating their **DNA**, which is the genetic material.* (Here, the underlines expression defines the word DNA)

- b. Check for the synonym of the word, that is the word which has the same or similar meaning with the unknown word.

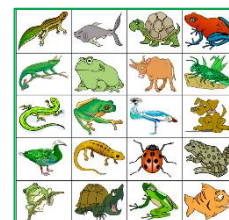
e.g.: *In humid climates, people often become fatigued. When they become tired, they should rest.* (Here, fatigued is the synonym for tired)

- c. Check for antonyms, that is, words which have opposite meaning

e.g.: *Multicellular organisms, which may consist of millions of individual cells, have an advantage over single-celled organisms in that their cells can be specialized to perform specific functions* (Here, multicellular is the opposite for single-celled)

- d. Check for examples of the unknown word in the sentence. e.g.

Amphibians such as *frog, toad*, etc. can live both in water and on the land.



Task 5: Work out the meaning of the words in bold in the following sentences.

1. Some living organisms like fireflies are **bioluminescent** which means that they produce and emit light.
2. The experiment was very **tedious**. There was nothing interesting I found about it.
3. The reason why I failed the exam was my **preconception** about Biology.

2

Language Study (1)

Adjectives:

Read again the text ‘Properties of Life’ and identify at least ten adjectives. Compare the adjectives you identified with the ones below:

living astounding alive raw diverse single-celled positive negative
basic cellular simple tiny complex digestive circulatory internal
cold hot organised specialised

Adjectives are words that describe a noun or a pronoun. They modify the noun or pronoun by giving more information about it

Examples:

[1] *Living* things come in an *astounding* variety of shapes and forms.

[2] Even very *simple*, *single-celled* organisms are remarkably *complex*.

In [1], the adjectives ‘living’ and ‘astounding’ describe respectively the nouns ‘things’ and ‘variety’.

In [2], the adjectives ‘simple’, ‘single-celled’, ‘complex’ modify the noun ‘organism’.



You will find that some words go together naturally. This is called **collocation**. For example, the word **system** is a noun. It collocates with the adjectives: *digestive*, *circulatory*, *immune*, *reproductive*, *respiratory*, *visual*, *biological*, etc.

Task 6: Match each adjective in Column A with the noun it describes from column B

A	B
1 Cellular	a system
2 living	b bacteria
3 Single celled	c organisms
4 digestive	d materials
5 specialised	e growth
6 raw	f characteristics
7 hot	g structures
8 basic	h climate
9 positive	i cells
10 organised	j things

3

Language Study (2)

Reference words

Task 7: Study the extracts below. What do the underlined words refer to?

[1] Biologists study life in many different ways. They live with gorillas, collect fossils, and listen to birds. They isolate viruses, grow mushrooms, and examine the structure of fruit flies.

[2] Biology is the key you need to unlock the mysteries of life. Through it, you discover that even single-celled organisms have their complexities, from their unique structures to their diverse metabolisms.

[3] Inside each cell, atoms make up molecules. These in turn make up cell components or organelles.

In extract [1] The pronoun ‘they’ refers back to the word ‘biologist. In extract [2] the pronoun ‘it’ refers back to the word ‘Biology’ and the pronoun ‘their’ refers back to the noun phrase ‘single-celled organisms’. In extract [3], the pronoun ‘these’ refers back to the word ‘molecules’

Reference words are used to avoid repeating the same material in a sentence or paragraph.

The most common reference words are:

1. **Personal pronouns:** I/ me, he/him, she/her, we/us, you, they/them, it
2. **Possessive pronouns:** mine, yours, his, hers, its, ours, theirs,
3. **Demonstrative pronouns:** this, that, these, those

Task 8: Read the extracts below and use appropriate reference words to avoid repeating the words in bold:

1. Biology is important because **Biology** helps us understand how living things work and how **living things** function and interact on multiple levels.
2. Ecology is the study of how organisms interact with the environment **of the organisms**
3. English has become a deemed necessity for scientists. **Scientists** who study and master this language will be more advantaged.
4. Maria is a well-known Biologist. **Maria** works at Cambridge University.

Task 9: Fill in the blanks with the words in the box

Those	these	it	our	that	ours
--------------	--------------	-----------	------------	-------------	-------------

1. Biology is a fascinating and important subject, because ... (1) ... dramatically affects our daily lives and our futures. Many biologists are working on problems that critically affect ... (2) ... lives, such as the world’s rapidly expanding population and diseases like cancer and AIDS. The knowledge ... (3) ... biologists gain will be fundamental to our ability to manage the world’s resources in a suitable manner, to prevent or cure diseases, and to improve the quality of our lives and ... (4) ... of our children and grandchildren.
2. Land plants are multicellular organisms that can be distinguished from other living things by the characteristic that ... (5) make their own food. We, humans cannot make ... (6)...

4

Listening and pronunciation

Pronunciation

Pronunciation plays an important role in speaking and listening. If you mispronounce a word, other people will not understand you. Similarly, if you don't 'know the right pronunciation of a word, you will not understand when others speak.

Task 10: Listen carefully how the words in the box are pronounced and then repeat.



Cell organelle single-celled fossil heredity
DNA(deoxyribonucleic acid) nutrient offspring homeostasis
digestive system stimulus chemicals species

Listening for Specific Information

When we listen, we sometimes look for a specific information. It may be an individual word or a phrase. The task below is intended to train you hear everything and to identify individual words.

Task 11: Listen (without watching) to the video “[Why learn Biology](https://www.youtube.com/watch?v=Q2iH8Bon8PI)” (available at <https://www.youtube.com/watch?v=Q2iH8Bon8PI>) and do the following tasks.

Task 11a: Listen and complete the sentences.

1. Biology is the _____ science concerned with the study of life and living _____. This could be a _____ or a _____ or a _____ even bacteria.
2. Biology is literally the study of living things _____ to gain _____ of how they work.
3. There is Taxonomy, this is the science of _____ living things into different _____ like birds, mammals and insects.
4. Then we have anatomy. This is the study of _____ structures of organs in living things thing like _____ or animals.
5. Cytology is the study of _____ and how they function.

6. _____ is the study of tissues. Nooo!, Not the ones you blow your nose with; the tissues that living bodies are made out of.
7. Palaeontology is the study of _____.
8. In Biology, the cell is the basic _____ of life. It is the most basic element in living things. It is able to replicate _____.
9. An animal, personal plant, is considered to be alive when it performs self-sustainable processes like eating, sleeping, and reproducing, anything that will keep it _____.
10. Finally, there is response. Living things must be sensitive to _____ stimuli and respond to them like moving away from _____ climates or protecting themselves from _____.

Task 11 b: Listen again to the text “[Why Learn Biology](#)” and choose the correct answer

1. The word *Biology* comes from the _____ words *bios* which means life, and *logos* which means study and knowledge.
 - a. German
 - b. Greek
2. Biology is a very wide subject. That’s why we _____ into different branches.
 - a. Split
 - b. sleep
3. The cell is the basic _____ blocks of any living organisms.
 - a. filling
 - b. building
4. There is reproduction. Living things have to reproduce new _____ or else their species would not survive.
 - a. offbeat
 - b. offspring
5. And we have Genetics which is the study of _____ and variations.
 - a. heredity
 - b. heritage

5

Writing

Simple definitions

When we write (or even when we speak), we sometimes need to define a word or a phrase. Definitions, which often occurs at the beginning of a piece of writing, demonstrate that we understand the key concept, and they are sometimes important to clarify how a particular term is being used.

Examples:

Biology is the natural science, which/that studies life.

A cell is the smallest unit of a living thing which/that retains all the properties of life.

A zoologist is a person who studies animals.

A doctor is a person who gives medical treatment to people.

A bat is a mammal which flies by night.

A school is an institution where children are educated.

Note: **Who** is used for a person, **which** (or that) is used for things and animals, **where** is used for places.

Task 12: Write the definition of each term in column A in the same way as in the examples.

Use the words and phrases from column B and C and the verb to be (is/are)

Example: 2==>a==>VII: A dentist is a person who treats people's teeth.

A		B		C	
1	1. A parasite	a	a person	I	that makes very small objects look larger
2	2. A dentist	b	an instrument	II	which lives on or inside other organisms and feeding at the host's experience
3	A microscope	c	a basic unit of matter	III	who studies plants
4	A botanist	d	an organism	IV	that will decay and become inedible over time
5	Food products	e	a person	V	a method of research with defined steps that include experiments and careful
6	An atom	f	a method of research with defined steps	VI	that studies the internal structure of leaving organisms a method of research with defined steps that include experiments and careful
7	A scientific method	g	a branch of Biology	VII	who treats people's teeth
8	Anatomy	h	perishables	VIII	which cannot be broken down by normal chemical reactions

5

Speaking practice

Task 13: Work in pairs. Ask your partner to explain three of the 7 basic properties of living things.

Appendix 3: Questionnaire for Natural Science Students

Dear student,

This questionnaire is given to you in the framework of the doctoral research I am doing at the University of Burundi. The main objective of my research is to promote the teaching/learning of English in departments other than languages. My PhD research will therefore attempt to analyse the English language needs of natural sciences students and examine the extent to which the current English language program at university respond to the needs of the students. Please, read first the instructions and answer all the questions. Remember! This questionnaire is not a test or exam. Therefore, there are no 'right' or 'wrong' answers; just answer as accurately as possible. Besides, you don't even need to write your name. We thank you very much in advance for your help!

Arcade Nduwimana,
PhD student at the University of Burundi
Assistant Lecturer at ENS du Burundi

Part 1: Demographics

*Institution: University of Burundi ☐ ENS du Burundi ☐

* Department and/or Section _____

*Level of Study: _____

Part 2: Attitudes towards learning English language

1. Below are statements describing attitudes towards learning English language. Each statement is followed by five boxes (A, B, C, D, and E). Please put a circle (O) in **one** of the boxes following each statement depending on how much you **agree** or **disagree** with the statement. Put a circle in box **A** (*strongly disagree*); in box **B** (*disagree*); in box **C** (*neutral=neither agree nor disagree*); in box **D** (*agree*); in box **E** (*strongly agree*).

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
A	B	C	D	E

Example: If you *strongly agree* with the statement “English is the easiest language to learn in the world”, circle the letter “**E**”

EX	English is the easiest language to learn in the world.	A	B	C	D	Ⓔ
----	--	---	---	---	---	---

1	People who are good at natural sciences (ex: Maths, Physics, Chemistry and Biology) are not good at learning English.	A	B	C	D	E
2	I attend English classes just to avoid absences.	A	B	C	D	E

3	I attend English classes just to get good mark in exam.	A	B	C	D	E
4	In my opinion, English is a very difficult language and is therefore complicated to learn.	A	B	C	D	E
5	When I am speaking in English, I have fear of making mistakes.	A	B	C	D	E
6	I believe English is the language of Arts students, not science students.	A	B	C	D	E
7	I regret the time I spend when learning English at University.	A	B	C	D	E
8	I would like the English course to be optional rather than compulsory.	A	B	C	D	E

Part 3: Your awareness of the status of English worldwide

2. The following statements are intended to evaluate your awareness of the status of English worldwide. Please, for each statement, choose an appropriate answer for you by putting a cross (X) in the box.

Statements	Yes	No	Not Sure
1 English is an international language of sciences and research.			
2 There is an increase in the use of English as a medium of instruction worldwide especially in tertiary education.			
3 English is closely associated with leading-edge technology.			
4 English is the working language of international organizations and conferences.			
5 English is the working language of international banking, economic affairs and trade.			
6 English is the global language of internet/electronic communication			
7 English is the working language of international law.			
8 English is the language of international tourism.			
9 English is a global lingua franca, that is, a language used for communication between people whose native languages are different from one another.			
10 English is the number one international language of publishing.			

Part3: Reasons for learning English at university

3. The following phrases describe the reasons for learning English at university. Choose an appropriate answer for you by putting a cross (X) in the box.

At university, I study/should study English...		Yes	NO	Not Sure
1	To get access to academic and scientific sources (books) published in English.			
2	Because I plan to continue my studies abroad at English medium universities			
3	To increase the chance to get a scholarship to study abroad.			
4	Because English is a global language of sciences			
5	Because English will give me more job opportunities in East African community (EAC) and elsewhere			
6	Because I would like to work in international companies			
7	Because English is a gateway to the world of science, commerce and culture			
8	Because English is the mostly spoken second language in the world			
9	Because I will need to discuss with foreign specialists in my domain			
10	Because I intend, in the future, to publish in English			
11	Because I will need English to travel abroad.			
12	Because I just need it to obtain my university degree.			
13	Because if I learn English I will become better educated.			
14	Others (please specify) _____ _____			

Part 4: Target situations (current, future/projected situations)

4. Now that you are still doing your studies at university, what do you need/use English for? Choose an appropriate answer for you by putting a cross (X) in the box.

What you need/use English for		Yes	No
1	To read science textbooks that are in the library		
2	To read the handouts/notes/syllabi that are given in English		
3	To search for internet resources		

4	To interact with English speaking foreigners		
5	To listen to scientific documentaries in English		
6	Others (please specify) : _____ _____ _____ _____		

5. In your future, what do you think you will need/use English for?

1	To continue your studies (master and/or doctorate)	Yes	No
2	To understand documents related to your speciality	Yes	No
3	To do a job interview in English	Yes	No
4	For work in a multinational company or institution	Yes	No
5	For work in the East African Community	Yes	No
6	To make online application for scholarship to study abroad	Yes	No
7	To travel in an English speaking country	Yes	No
8	To complete forms and official documents in English	Yes	No
9	To attend conferences in English	Yes	No
10	To travel abroad	Yes	No

Part 5: Your Perception of the language needs

6. How important the following skills/areas are

- 1) For your academic studies?
- 2) For your targeted career or your future professional life?

A= very Important, **B**= Quite important, **C**= slightly important, **D**=not important at all

a)Importance of the skills for your studies		b) Importance of the skills for your future/targeted career
--	--	--

Very Important	Quite important	Slightly important	Not important at all	Skills/areas	Very Important	Quite important	Slightly important	Not important at all
a	b	c	d	Reading and understanding	a	b	C	d
a	b	c	d	Writing	a	b	C	d
a	b	c	d	Listening	a	b	C	d
a	b	c	d	Speaking	a	b	C	d
a	b	c	d	Scientific/Technical vocabulary	a	b	C	d
a	b	c	d	English grammar	a	b	C	d
a	b	c	d	Pronunciation	a	b	C	d

7. Among the **above** 7 skills and areas, say **ONLY ONE** you think you need the most? (Write your answer here) _____

8. The following are skills and strategies. For each of them:

- Indicate how important you think the skill/strategy is
- Describe or rate your level of knowledge in the skill/strategy
-

a) How Importance you think the skills are					b)Your level of knowledge in the skills				
Very Important	Quite important	Slightly important	Not important at all	Skills and strategies	Very weak	weak	Average	Good	Very good
a	b	c	d	1.Speaking clearly (with correct pronunciation) when talking about your field of study in English	A	b	c	d	e
a	b	c	d	2.Speaking accurately (without making mistakes in grammar, vocabulary and pronunciation) when talking about your field of study in English	A	b	c	d	e
a	b	c	d	3.Doing a scientific oral presentation in English	A	b	c	d	e
a	b	c	d	4. Being able to interpret figures, graphs and charts?	A	b	c	d	e

a	b	c	d	5. Reading quickly to get the general idea of scientific texts (skimming)	A	b	c	d	e
a	b	c	d	6. Distinguishing facts from opinions when reading scientific texts	A	b	c	d	e
a	b	c	d	7. To identify cause-effect relationships in a scientific text	A	b	c	d	e
a	b	c	d	8. Read carefully so as to understand the details of a scientific text	A	b	c	d	e
a	b	c	d	9. To guess the meaning of the unknown word from the context	A	b	c	d	e
a	b	c	d	10. Reading quickly to find specific information in a scientific text	A	b	c	d	e
a	b	c	d	11. Using dictionary	A	b	c	d	e
a	b	c	d	12. Inferring and identifying key information in the scientific text	A	b	c	d	e
a	b	c	d	13. Understanding written instructions	A	b	c	d	e
a	b	c	d	14. Understanding the main points of a scientific text	A	b	c	d	e
a	b	c	d	15. Understanding public notices	A	b	c	d	e
a	b	c	d	16. Taking notes from what you read	A	b	c	d	e
a	b	c	d	17. Reading critically scientific texts	A	b	c	d	e
a	b	c	d	18. Writing formal/professional letters	A	b	c	d	e
a	b	c	d	19. Reporting scientific/ research results	A	b	c	d	e
a	b	c	d	20. Writing different types of essays	A	b	c	d	e
a	b	c	d	21. Writing a summary	A	b	c	d	e
a	b	c	d	22. Synthesizing ideas or information from more than one scientific source	A	b	c	d	e
a	b	c	d	23. Filling in online form for scholarship application	A	b	c	d	e
a	b	c	d	24. Describing scientific processes/phenomena	A	b	c	d	e
a	b	c	d	25. Listening to a lecture/lecturer	A	b	c	d	e
a	b	c	d	26. Taking notes in lectures, meetings or conferences	A	b	c	d	

a	b	c	d	27. Understanding instructions given orally.	A	b	c	d	
a	b	c	d	28. Guessing the meaning of difficult words from context while listening to scientific texts	A	b	c	d	

Part 6: Your beliefs about language learning and your preferred strategies and activities in the classroom

11. The following statements describe beliefs about English language learning. Please, indicate the extent to which you *agree* or *disagree* by circling the appropriate letter

Statements		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I learn/would learn English better if activities are given in groups	A	b	c	d	e
2	I learn/would learn English better if activities are given in pairs	A	b	c	d	e
3	I don't worry about making mistakes when learning English	A	b	c	d	e
4	I learn/would learn better if the teacher uses translation when explaining his lectures	A	b	c	d	e
5	I learn/would learn better if the teacher uses videos and audios from native speakers in the classroom	A	b	c	d	e
6	I learn/would learn English better if teachers use visual materials (videos, diagrams, photos, pictures).	A	b	c	d	e
7	The best language learning materials are written texts/reading comprehension texts.	A	b	c	d	e
8	I learn/would learn better if learning activities involve audio materials (listening to lectures, conversations/ songs).	A	b	c	d	e
9	I learn/would learn better if the teacher uses scientific texts rather than general English texts	A	b	c	d	e
10	I would you like to spend much of my time doing activities by myself rather than listening to the English teacher	A	b	c	d	e

11	I learn /would learn better when the English teacher gives us the opportunity to practice role-plays and share ideas, opinions and experiences	A	b	c	d	e
12	I learn/would learn better if teachers incorporate individual, pair, and group work.	A	b	c	d	e

Part 7: Your views on the strategies to improve your English knowledge overall

12. Do you think the following strategies can help you improve your English? Put a cross.

	Strategies	Yes	No	I don't Know
1	Reading any English text that is interesting to you			
2	Watching television in English			
3	Watching movies in English			
4	Listening to native speakers on the radio			
5	Revising regularly my English course			
6	Doing the homework			
7	Visiting web sites that are in English			

Part 8: Evaluation of the English course at university

Satisfaction with the English course

9. By putting a cross (X), how can you rate your knowledge in English?

		Very poor	Poor	Fair	Good	Very good
1	Before you study an English course at university. How was your knowledge					
2	Now that you have finished a course at university, how is your knowledge?					

9. To what extent do you think the English course (at university) has helped you to achieve each of the following objectives: (A=did not help me at all; B= helped me to a small extent; C helped me to some extent; D = helped me to a great extent)

The English course at University helped me					
Objectives		Did not help me at	To a small Extent	To some extent	To great extent
1	To develop reading comprehension skills and strategies	a	b	c	d
2	To improve writing skills	a	b	c	d
3	To develop the ability to understand spoken English	a	b	c	d
4	To develop oral expression in general	a	b	c	d
5	To improve the knowledge of grammar	a	b	c	d
6	To expand knowledge of scientific vocabulary in English	a	b	c	d
7	To improve my pronunciation in English	a	b	c	d

10. Please indicate how often the following happens in your English class by circling the letter for appropriate response (A= never, B= rarely, C sometimes, D= often E= always)

Statements		Never	Rarely	Sometimes	Often	Always
1	Kirundi and French are mainly used throughout the English course	a	b	c	d	e
2	English vocabulary is taught in the form of isolated words	a	b	c	d	e
3	Much class time is spend on grammar and translation exercises	a	b	c	d	e
4	Reading activities take up a considerable amount of class time, and the main focus is placed on translating English into French or Kirundi	a	b	c	d	e
5	Considerable amounts of class time are dedicated to repetitive drills.	a	b	c	d	e
6	The teacher just talks and students listen	a	b	c	d	e
7	Much focus is put on memorization over other forms of learning	a	b	c	d	e
8	The teacher gives opportunity to students to actively participate in the classroom by giving activities that involve role-plays, paired discussion and group discussion	a	b	c	d	e

11. Please, indicate to what extent you agree or disagree with the following statements
(A=Strongly Disagree, B=Disagree, C= Neutral, D= Agree, E= Strongly Agree)

Statements		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	The content of the course reflect real life use of English in scientific context	a	b	c	d	e
2	The materials used in the English course are very appropriate and covers many topics which reflect real-life situation in scientific context	a	b	c	d	e
3	The English teacher gives us tasks and activities that reflect real-life situations	a	b	c	d	e
4	Test/ assignment that are given reflect target real life situations.	a	b	c	d	e
5	Thanks to the English course, I can now independently read scientific texts	a	b	c	d	e
6	The English course helped me to get access to specific bibliography related to my domain	a	b	c	d	e
7	The English course is relevant to my targeted career	a	b	c	d	e
8	In the English course, the teachers use texts that are related (reflect) my field of study and therefore motivating	a	b	c	d	e
9	The time allocated to the English course is sufficient enough for you to develop necessary skills in English	a	b	c	d	e
10	The teachers use recorded native English speakers voices to help us improve our listening	a	b	c	d	e
11	The course is appropriate to my level in English	a	b	c	d	e
12	The teacher uses videos and audios from native speakers in the classroom	a	b	c	d	e

Thank you very much for your cooperation!

Appendix 4 : Questionnaire for Subject Specialist Teachers

Dear colleague,

My name is Arcade Nduwimana. I am an assistant lecturer at the Ecole Normale Supérieure du Burundi and at the same time I am a PhD student at the University of Burundi. The main objective of my doctoral research is to promote the teaching/learning of English in departments other than languages, especially in natural sciences departments. My PhD research will attempt to analyse the English language needs of natural sciences students and examine the extent to which the current English language courses at university respond to the needs of the students.

This questionnaire is therefore given to you in the framework of my research in order to request your contribution to the study. Please, read first the instructions and answer all the questions. I am pleased to inform you that there are no 'right' or 'wrong' answers. Besides, the confidentiality of your responses will totally be guaranteed. Your responses will therefore be used for ONLY research purposes. I thank you VERY MUCH in advance for your help!

Arcade Nduwimana
PhD student at the university of Burundi
Assistant lecturer at Ecole Normale Supérieure du Burundi

Part 1: Demographics

- *Institution: University of Burundi ☐ ENS du Burundi ☐
- * Department and/or Section _____
- * Years of teaching experience at university _____
- * Where did you do your undergraduate studies? _____
- * In your undergraduate or postgraduate studies, have you ever used English as a language of instruction Yes ☐ No ☐

Part 2: Attitudes towards learning English language

1. Below are statements describing attitudes towards learning English language. Each statement is followed by five boxes (A, B, C, D, and E). Please put a circle (O) in **one** of the boxes following each statement depending on how much you **agree** or **disagree** with the statement. Put a circle in box **A** (*strongly disagree*); in box **B** (*disagree*); in box **C** (*neutral=neither agree nor disagree*); in box **D** (*agree*); in box **E** (*strongly agree*).

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
A	B	C	D	E

Example: If you *strongly agree* with the statement “English is the easiest language to learn in the world”, circle the letter “E”

EX	English is the easiest language to learn in the world.	A	B	C	D	Ⓔ
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1	People who are good at natural sciences (ex: Maths, Physics, Chemistry and Biology) are not good at learning English	A	B	C	D	E
2	Sciences students should attend English classes just to avoid absences.	A	B	C	D	E
3	Students should attend English classes just to get good mark in exam	A	B	C	D	E
4	In my opinion, English is a very difficult language and is therefore complicated to learn for science students	A	B	C	D	E
5	I believe English is the language of Arts students, not science students	A	B	C	D	E
6	English teachers should regret the time they spend when teaching English in departments other than that of English	A	B	C	D	E
7	In science departments, the English course should be optional rather than compulsory.	A	B	C	D	E

Part 3: Your awareness of the status of English worldwide

2. The following statements are intended to evaluate your awareness of the status of English worldwide. Please, for each statement, choose an appropriate answer by putting a cross (X) in the box.

Statements	Yes	No	Not Sure
1 English is an international language of sciences and research.			
2 There is an increase in the use of English as a medium of instruction worldwide especially in tertiary education.			
3 English is closely associated with leading-edge technology.			
4 English is the working language of international organizations and conferences.			
5 English is the working language of international banking, economic affairs and trade.			
6 English is the global language of internet/electronic communication			
7 English is the working language of international law.			
8 English is the language of international tourism.			
9 English is a global lingua franca, that is, a language used for communication between people whose native languages are different from one another.			
10 English is the number one international language of publishing.			

Part 4: Reasons for learning English at university

3. The following phrases describe the reasons for learning English at university. Choose an appropriate answer for you by putting a cross (X) in the box.

At university, science students' study/should study English...:		Yes	N0	Not Sure
1	To get access to academic and scientific sources (books) published in English.			
2	Because they may continue their studies abroad at English medium universities			
3	To increase the chance to get a scholarship to study abroad.			
4	Because English is a global language of sciences			
5	Because English will give them more job opportunities in East African community (EAC) and elsewhere			
6	Because English will help them to work in international companies			
7	Because English is a gateway to the world of science, commerce and culture			
8	Because English is the mostly spoken second language in the world			
9	Because they will need to discuss with foreign specialists in their domains			
10	Because they may need , in the future, to publish in English			
11	Because they will need English to travel abroad			
12	Because they just need it to obtain their university degree			
13	Because if they learn English they will become better educated			
14	Others (please specify) _____ _____ _____			

Part 5: Target situations (current, future/projected situations)

4. Now that students are still doing their studies at university, what do they need/use English for? Choose an appropriate answer by putting a cross (X) in the box.

What students need/use English for		Yes	No
1	To read science textbooks that are in the library		
2	To read the handouts/notes/syllabi that are given in English		
3	To search for internet resources		
4	To interact with English speaking foreigners		
5	To listen to scientific documentaries in English		
6	Others (please specify) : _____ _____ _____ _____		

5. In their future, what do you think students will need/use English for?

1	To continue their studies (master and/or doctorate)	Yes	No
2	To understand documents related to their speciality	Yes	No
3	To do a job interview in English	Yes	No
4	For work in a multinational company or institution	Yes	No
5	For work in the East African Community	Yes	No
6	To make online application for scholarship to study abroad	Yes	No
7	To travel in an English speaking country	Yes	No
8	To complete forms and official documents in English	Yes	No
9	To attend conferences in English	Yes	No
10	To travel abroad	Yes	No

Part 6: Your Perception of the language needs

6. How important the following skills/aspects are

3) For students' academic studies?

4) For their targeted career or their future professional life?

A= very Important, B= Quite important, C= slightly important, D=not important at all

a)Importance of the skills for students' studies					b) Importance of the skills for their future/targeted career			
Very Important	Quite important	Slightly important	Not important at all	Skills/aspects	Very Important	Quite important	Slightly important	Not important at all
A	b	c	d		a	b	c	d
A	b	c	d	Reading and understanding	a	b	c	d
A	b	c	d	Writing	a	b	c	d
A	b	c	d	Listening	a	b	c	d
A	b	c	d	Speaking	a	b	c	d
A	b	c	d	Scientific (technical) vocabulary	a	b	c	d
A	b	c	d	English grammar	a	b	c	d
A	b	c	d	Pronunciation	a	b	c	d

7. Among the **above** 6 skills and areas, say **ONLY ONE** you think they need the most? (Write your answer here) _____

8. The following are English skills and strategies. For each of them:

d) Indicate how important you think the skill/strategy is for your students

e) Describe or rate students' level of knowledge in the skill/strategy

1) How Important you think the skills are for your students	2) Students' level of knowledge in the skills

	Skills and strategies	Very Important	Quite important	Slightly important	Not important at all
1	Speaking clearly (with correct pronunciation) when talking about their field of study in English	a	b	c	d
2	Speaking accurately (without making mistakes in grammar, vocabulary and pronunciation) when talking about their field of study in English	a	b	c	d
3	Doing a scientific oral presentation in English	a	b	c	d
4	Being able to interpret figures, graphs and charts?	a	b	c	d
5	Reading quickly to get the general idea of scientific texts (skimming)	a	b	c	d
6	Distinguishing facts from opinion when reading scientific texts	a	b	c	d
7	To identify cause-effect relationships in a scientific text	a	b	c	d
8	Read carefully so as to understand the details of the text	a	b	c	d
9	To guess the meaning of the unknown word from the context	a	b	c	d
10	Reading quickly to find specific information in the text	a	b	c	d
11	Using a dictionary	a	b	c	d
12	Inferring and identifying key information in the text	a	b	c	d
13	Understanding written instructions	a	b	c	d
14	Understanding the main points of a text	a	b	c	d
15	Understanding public notices	a	b	c	d
16	Taking notes from what you read	a	b	c	d
17	Reading critically scientific texts	a	b	c	d
18	Writing formal/professional letters	a	b	c	d
19	Reporting scientific/ research results	a	b	c	d
20	Writing different types of essays	a	b	c	d
21	Writing write a summary	a	b	c	d
22	Synthesizing ideas or information from more than one scientific source	a	b	c	d
23	Filling in online form for scholarship application	a	b	c	d
24	Describing scientific processes/phenomena	a	b	c	d
25	Listening to a lecture/lecturer	a	b	c	d
26	Taking notes in lectures, meetings or conferences	a	b	c	d
27	Understanding instructions given orally.	a	b	c	d
28	Guessing the meaning of difficult words form context while listening to scientific texts	a	b	c	d

Part 7: Your beliefs about language learning and your preferred strategies and activities in the classroom

9. The following statements describe beliefs about English language learning. Please, indicate the extent to which you *agree* or *disagree* by circling the appropriate letter

Statements		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Students learn/would learn better if activities are given in groups	a	b	c	d	e
2	Students learn/would learn better if activities are given in pairs	a	b	c	d	e
3	Students should not worry about making mistakes when learning English	a	b	c	d	e
4	students learn/would learn better if the teacher use translation when explaining	a	b	c	d	e
5	Students learn/would learn better if the teacher use videos and audios from native speakers in the classroom	a	b	c	d	e
6	Students learn/would learn English better if teachers use visual materials (videos, diagrams, photos, pictures).	a	b	c	d	e
7	The best language learning materials are written texts/reading comprehension texts.	a	b	c	d	e
8	Students learn/would learn better if learning activities involve audio materials (listening to lectures, conversations/ songs).	a	b	c	d	e
9	Students learn/would learn better if the teacher uses scientific texts rather than general English texts.	a	b	c	d	e
10	Students learn/would learn better if they spend much of their time doing activities by themselves rather than listening to the teacher	a	b	c	d	e
11	Students learn /would learn better if the teacher gives them opportunity to practice role-plays and share ideas, opinions and experiences	a	b	c	d	e
12	Students learn/would learn if teacher incorporate individual, pair, and group work	a	b	c	d	e

Part 8: Your views on the strategies to improve English knowledge overall

10. Do you think the following strategies can help you improve your English? Put a cross.

	Strategies	Yes	No	I don't Know
1	Reading any English text that is interesting to me			
2	Watching television in English			
3	Watching movies in English			
4	Listening to native speakers on the radio			
5	Revising regularly my English course			
6	Doing homework			

7	Visiting web sites that are in English			
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Part 9: Final questions

11. Does it happen that you give to students notes/handouts that are in English?

Yes

NO

12. Would you recommend students to read science books written in English?

Yes

No

13. In your department, the time allocated to the English course is 30H in BAC I and 30H in BAC II. Is this time sufficient for students to develop necessary skills in order to meet their English language needs?

Yes

No

14. What would you recommend in order to promote the teaching/learning of English language in your department/Faculty? _____

Thank you very much for your cooperation!

Appendix 5 : Questionnaire for Policymakers

Dear Sir/Madam

This questionnaire is sent to you in the framework of a doctoral research conducted at the University of Burundi. The main objective of this doctoral research is to promote the teaching/learning of English in departments other than languages, especially in natural sciences departments. Please answer all the questions. As your contribution will be of great importance, I thank you VERY MUCH in advance for your help!

Part 1: Your awareness of the status of English worldwide

2. The following statements are intended to evaluate your awareness of the status of English worldwide. Please, for each statement, choose an appropriate answer by putting a cross (X) in the box.

Statements	Yes	No	Not Sure
1 English is an international language of sciences and research.			
2 There is an increase in the use of English as a medium of instruction worldwide especially in tertiary education.			
3 English is closely associated with leading-edge technology.			
4 English is the working language of international organizations and conferences.			
5 English is the working language of international banking, economic affairs and trade.			
6 English is the global language of internet/electronic communication			
7 English is the working language of international law.			
8 English is the language of international tourism.			
9 English is a global lingua franca, that is, a language used for communication between people whose native languages are different from one another.			
10 English is the number one international language of publishing.			

Part 2: Reasons for learning English at university

3. The following phrases describe the reasons for learning English at university. Choose an appropriate answer for you by putting a cross (X) in the box.

At university, science students study/should study English...:		Yes	NO	Not Sure
1	To get access to academic and scientific sources (books) published in English.			
2	Because they may continue their studies abroad at English medium universities			

3	To increase the chance to get a scholarship to study abroad.			
4	Because English is a global language of sciences			
5	Because English will give them more job opportunities in East African community (EAC) and elsewhere			
6	Because English will help them to work in international companies			
7	Because English is a gateway to the world of science, commerce and culture			
8	Because English is the mostly spoken second language in the world			
9	Because they will need to discuss with foreign specialists in their domains			
10	Because they may need , in the future, to publish in English			
11	Because they will need English to travel abroad			
12	Because they just need it to obtain their university degree			
13	Because if they learn English they will become better educated			
14	Others (please specify)			

Part 3: Final questions

1. In natural science departments, the time allocated to the English course is 30H in BAC I and 30H in BAC II. Is this time sufficient for students to develop necessary skills in order to meet their English language needs?

Yes

NO

2. Should the English course be taught at all levels of undergraduate studies (that is, 1st, 2nd and 3rd years)?

Yes

No

3. To help students immerse themselves in learning English, should science teachers (who can teach in English) be allowed to teach their science course in English?

Yes

No

4. Are you in favour of the creation of a coordination board for scientific English courses, not only at the level of curriculum design but also at the level of production of common materials for the same fields of study?

Yes

No

Thank you very much for your cooperation!

Appendix 6: Interview Guide for Natural Science Students

Opening question: <i>What do you think of the teaching of English in Burundi?</i>		
Major themes	Main questions	Additional questions
1. Importance of teaching/learning English in science departments	- What is the importance of teaching/learning English for you as a science student? - What could be the reasons for teaching/learning English in science departments?	-Do you have something to add?
2. Target situations in which learners will use the language	-What do you think are the possible situations in which you use or will use the English language?	- What are the current situations? - What are the projected/future situations? -What are the academic situations? -What are the job-related situations?
3. Perceptions of the needs	-What do you think you, as a (natural) science student, need in terms of the English language? -What would you like your English teacher to teach you?	-What language aspects (e.g. grammar, vocabulary, etc.) do you need? - What skills do you need to develop? - What activities should be used in class?
4.Methodology	-What would be, for you, the good way to learn the English language? -How would you like your English teachers to teach you?	
5.Students' appraisal of the ESP course	What is your appraisal of the English course at your department?	- Is the time allocated to the course sufficient? - Are you satisfied with the way teachers teach you? - Are you satisfied with the content of the course? - Are you satisfied with the materials used? -Are you satisfied with the objectives of the course
Conclusion of the interview: <i>Would you like to add anything I have not mentioned?</i>		

Appendix 7: Interview Guide for Subject Specialist Teachers

Opening question: <i>What do you think of the teaching of English in Burundi?</i>		
Major themes	Main questions	Additional questions
1. Importance of teaching/learning English in science departments	- What is the importance of teaching/learning English in natural sciences departments? - What could be the reasons for teaching/learning English in natural sciences departments?	Do you have anything to add?
2. Target situations in which learners will use the language	-What do you think are the possible situations in which the learners use/ will use the English language?	- What are the current situations? - What are the projected/ future situations? -What are the academic situations? -What are the job-related situations?
3. Perceptions of the needs	-What do you think natural sciences students need in terms of the English language?	-What language aspects (e.g. grammar, vocabulary, etc.) do they need? - What skills do they need? - What activities should be given to them?
4.Methodology	-In your opinion, what would be the good way to learn the English language? -How would you like English teachers to teach in science departments?	
5. Use of English (in their profession)	To what extent do you use English in your profession?	-Do you happen to give handouts/notes in English? - If yes, how often do you do it? - do you recommend students to read science books that are written in English? -Do you use English sources when you are preparing you course?
6.Appraisal of the course	Do you think that the English course that is given to science students meets their needs?	-Is the time (30 hours) allocated to the course sufficient?
Conclusion of the interview: Would you like to add anything I have not mentioned?		

Appendix 8: Interview Guide for ESP Teachers

Opening question: <i>What do you think of the teaching of English in departments other than English?</i>		
Majors themes	Main questions	Additional questions
1.Importance of teaching/learning English in science departments	- What is the importance of teaching/learning English in natural sciences departments? - What could be the reasons for teaching/learning English in natural sciences departments?	-Do you have anything to add?
2. Target situations in which learners will use the language	-What do you think are the possible situations in which the learners use or will use the language they are learning?	- What are the current situations? - What are the projected/ future situations? -What are the academic situations? -What are the job-related situations?
3. Perceptions of the needs	-What do you think natural sciences students need in terms of the English language?	-What language aspects (e.g. grammar, vocabulary, etc.) do they need? - What skills do they need? - What activities should be given to them?
4. Language difficulties	-What difficulties do those students encounter?	-What are the language aspects that cause difficulties to students? - What skills/activities do students find difficult?
5.Contents of the course	- What do you put in the content of your course?	-What are the areas, skills you focus on?
6. Selection of the contents	-How do you select the contents of your course?	- do you analyse the target situations? - do you rely on the objectives as stated in the curricula? - What can you add to this?
7. Methodology	- What methodology do you use when teaching?	-How do you proceed in the classroom (when teaching)?
8. Materials used	* What type of material do you use? *How do you select them?	* Text materials? Audio, or video materials - Do you have pre-conceived materials as in secondary school)? -Do you use available (published) materials? Or you design them yourself? -How do you select among available materials?
Conclusion of the interview: Would you like to add anything I have not mentioned?		

Appendix 9: Research Permit from the University of Burundi



UNIVERSITE DU BURUNDI
DIRECTION DE LA RECHERCHE ET DE L'INNOVATION
2 AVENUE DE L'UNESCO
B.P. 1550 BUJUMBURA – BURUNDI

ATTESTATION A QUI DE DROIT

Je soussigné Pr. Tatien MASHARABU, Directeur de la Recherche et de l'Innovation à l'Université du Burundi, atteste par la présente que **Monsieur Arcade NDUWIMANA**, est régulièrement inscrit à l'Ecole Doctorale à l'Université du Burundi (Année Académique 2018-2019).

Sa thèse de doctorat s'intitule *"English for Specific Purposes in Burundi Higher Education: A Needs Analysis Perspective."*

Dans le cadre de ses travaux de recherche et de terrain, le doctorant aura besoin d'administrer des questionnaires, de faire des interviews auprès des étudiants, des enseignants ainsi que d'autres autorités. Il aura également besoin d'accéder à quelques documents comme la catalogue de la bibliothèque, les descriptifs des cours d'anglais, les registres de classe etc. Par conséquent, je vous saurai gré de faciliter la tâche à ce chercheur en lui permettant l'accès sur le terrain et la récolte des données se rapportant à son domaine de recherche.

Il va sans dire que l'intéressé se conformera aux lois et règlements régissant l'accès à la documentation dans le cadre de la recherche scientifique ainsi qu'aux dispositions particulières éventuelles régissant l'accès à l'information dans votre institution.

Fait à Bujumbura le 20/9/2019

Pr. Tatien MASHARABU,
DIRECTEUR DE LA RECHERCHE ET
DE L'INNOVATION

P.O. Attachée de Direction
Gloria NDUWIMANA
A blue ink signature of Gloria NDUWIMANA, with a circular official stamp of the University of Burundi in the background.

Appendix 10: Research Permit from the BHIE



REPUBLIQUE DU BURUNDI
Ecole Normale Supérieure
Direction Générale

N/Réf : 610/ENS/DG/54572019

A Monsieur NDUWIMANA Arcade
à
Bujumbura

Objet : Votre demande d'autorisation pour enquête

Monsieur,

Nous accusons réception de votre lettre du 13 septembre par laquelle vous demander une autorisation pour enquête au sein de notre institution dans le cadre de la réalisation de votre thèse doctorale intitulé : «English for Specific Purposes in Burundi Higher Education : A Needs Analysis Perspective».

Par la présente, nous avons l'honneur de vous informer que nous marquons notre accord de principe.

Veuillez agréer, Monsieur, l'assurance de notre considération distinguée.

Le Directeur Général de l'Ecole
Normale Supérieure

Prof. Ir. NUSURA Hassan

C.P.I. à :

- Madame/Monsieur le Directeur (tous)
- Monsieur le Chef du Département (tous)
- Monsieur le Chef du Service aux étudiants
- Monsieur le Chef du Service Enseignants et Enseignements
- Monsieur le Chef du Service de la Bibliothèque

de l'Ecole Normale Supérieure
à
Bujumbura



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