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English for specific purposes: writing scientific research papers. Case study: PhD students in the computer science department.

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Abstract

The present study investigated the difficulties facing by PhD students when writing their scientific research articles. Therefore, the questionnaires were designed to gain as much as possible information about students' profiles and difficulties. The required data for the study were collected via online questionnaire (Google Forms) and hard copy version of the questionnaire. The study sample was mainly composed of the PhD students from Computer science department, University of Biskra to answer questionnaires about the difficulties they face. The findings of this study showed that PhD students face various challenges and difficulties in writing their scientific research articles. The obtained data revealed that the difficulties of the candidates are represented mainly, in addition to the technical content, the poor level of English especially: Grammar, Vocabulary, writing styles, use of tenses ….etc. Also, they receive the most remarks of the reviewers on the sections of: 1) introduction and 2) discussion of the findings. Moreover, the participants expressed that they were not prepared enough for the Scientific writing in general and the writing of research article as well. On the basis of these results, several suggestions and recommendations have been proposed to overcome these difficulties.

Key words: Scientific writing, Academic writing, Scientific research Article, Scientific writing difficulties. ESP.

List of acronyms and abbreviations

CARS: Creating A Research Space.

EAP: English for Academic Purposes

EBE: English for Business and Economics

EFL: English as a Foreign Language.

EGAP: English for General Academic Purposes.

EGP: English for General Purposes.

EILS: English as an International Language of Sciences.

ELF: English as Lingua Franca

ELP: English for Legal Purposes.

ELT: English Language Teaching.

EMP: English for Medical Purposes.

EMT: English as a Mother Tongue.

EOP: English for Occupational Purposes.

ERPP: English for Research and Publication Purposes.

ESAP: English for Specific Academic Purposes.

ESL: English as a Second Language.

ESP: English for Specific Purposes.

ESS: English for Social Science.

EST: English for Science and Technology

GE: General English.

TESOL: Teaching English to Speakers of Other Languages.

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General Introduction

It is generally agreed that English has attracted the attention of many researchers due to its importance and large use around the world and in all fields. In addition, the English has become the international language of science and technology. Therefore, many scientists and researchers are encouraged to learn English in order to read and understand different scientific references and documents and write their scientific research papers. The scientific fields such as: medicine, computer sciences, …etc. are, undoubtedly, in great need to facilitate access to information and research, which is mainly available in English. Thus, the teaching of such a language for these students appears to be more than a necessity for either academic studies or professional purposes.

Writing is an essential skill in learning the language because learners always need to write paragraphs, essays, assignments and express their ideas and thoughts. Moreover, writing skill involves mastering many aspects of the language at the same time such as: grammar, spelling, letter formation, vocabulary, punctuation, capitalization, content, and structure of the written text. All of these skills must be automatic for writing to be effective. However, for many students and researchers, this is a big task and have many difficulties.

Scientific research articles provide a method for scientists to communicate with other scientists about the results of their research. In these articles a standard format is used the research is presented in an orderly, logical manner. Writing research articles is an important task for scientists and it requires the developments of special writing skills and using standard format. scientists should know how to apply their analysis and synthesis skills to overcoming the challenge

of how to write, as well as what to write, to maximise their chances of publishing in international scientific journals.

Usually, the PhD students write research papers which they either deliver at scientific conferences or publish as articles in scientific journals. For these students, it is generally exciting and difficult task for them to write their first research articles. They face a mountain of data, notes, and other remnants of the research process, it may be difficult to figure out where and how to begin the manuscript writing process. In order to write a good research article, it is helpful to understand the objectives of scientific writing before diving into the task. First of all, scientific writing must aim for clarity, simplicity, and accuracy. These should be the touchstones for authors of research articles, particularly in the field of science because the scientific research papers have a reputation for being difficult to understand. It is a fine balance that authors of scientific writing must maintain achieving the recognition and respect of those in their field as well as making sure their work is comprehensible to a wider audience.

Statement of the problem

Generally, learning a foreign language is not an easy task to be achieved. Writing is one of the productive skills that is crucially essential for English as a Foreign Language learners. In an academic setting, enhancing writing skills for the students is the primary objective in education. For students to develop their writing competence, they are expected to produce a well-structured piece of writing. Moreover, mastering how to organize, regulate writing behaviour, review the composition, and provide readers awareness have also become the crucial aspect for creating a well-produced piece of writing. In several contexts, students face different difficulties in many aspects of writing. Therefore, several researchers have increasingly put more emphasis on

academic writing from different sides. It is important for educators to recognize where the breakdown in written language occurs, and find creative ways to assist these students.

English is the language of writing research papers for scientific domains and of presenting scientific works in conferences and workshops. One of the most important criteria of accepting the scientific work is the high good style of writing. In many cases, journals refuse a good scientific work because the bad and low level of English used in the presenting of this work. The scientific researchers, are obliged to pay for proof reading in order to improve the writing style of their papers but sometimes it needs an expert of the domain to really correct it. Therefore, the scientific researchers should learn English and reach acceptable level. However; it is very difficult for them to learn the English language in general because it requires time and efforts.

Thus, ESP (English for specific purposes) is considered as a rapid and successful solution for them. In addition, it allows them to learn academic and scientific writing in term of style, grammar, use of modals, vocabulary, sentence structure and characteristics…etc

In this respect, the present study to investigate the difficulties faced by doctoral students of Computer Science, Biskra University while writing their scientific research articles. Then, some suggestions will be presented in order to overcome the majority of these difficulties.

Research Questions

This study attempts to answer the following questions:

- What are the difficulties of writing a scientific paper?
- Using ESP will help the scientific researchers to learn English more efficiently?
- What are the suggestions to learn scientific English and writing scientific research papers?

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Research Hypothesis

PhD Students were not prepared enough for the scientific and academic writing on the doctoral degree. Also, they face various difficulties in writing their scientific research articles in term of English language. Another hypothesis that is ESP improves the level of English efficiently and quickly and the focus on the specific English for each domain allows to gain time of learning. Finally, ESP helps the learners to master how to write scientific research papers better than general English

Significance of the Study

Using English for specific purposes that focuses on the teaching of scientific writing skills and its specificities for the PHD students of Computer Science of Biskra University will help them to write good scientific research articles. The study aims to review the most important difficulties for these students in term of writing scientific articles and tries to overcome them.

Methodology

The researcher is expected to collect data and information for the study using a descriptive method design. A questionnaire will be designed and administered to PHD students, computer science department of University of Biskra, to reveal their most important issues and difficulties and their experience and knowledge about “writing scientific research article”. The questionnaire will take into account all the aspects and parts of the research article. Eventually, the results will be presented and analysed in order to answer the research questions.

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Population and Sample

The study sample will be mainly composed of selected randomly PHD students from Computer science department to answer questionnaires about the difficulties they face. The rationale for this choice is to investigate the effective use of ESP to enhance the skills of writing scientific research article.

Data Collection Procedure

The students' questionnaire was distributed to the PhD students of the department of computer science (LINFI laboratory and LESIA laboratory) who are required to answer individually by giving their opinions about the subject. Then, the answers were collected and analysed.

Research Design

The method of this research is the qualitative method. The students' questionnaires are more useful in helping to better understand students' needs and achieving more reliable and comprehensive information. The researchers chose the descriptive way to deal with the variables in this study. Questionnaires for students are used as research tools that are useful in collecting data. The analysis of student's questionnaire has shown the most frequent difficulties face by the PhD students when writing their research papers.

Structure of the dissertation

This dissertation is composed of an independent variable, which is "ESP" and a dependent variable which is "writing scientific article". Many topics and studies deal with how we enhance the skills of writing scientific research article for novice using ESP methods. The study is based on two sections: the theoretical and the practical part. The theoretical section contains two chapters. The first one presents the main concepts and notions of ESP. The second chapter explains the

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writing of scientific research paper from several sides: structure, methodology, grammar, vocabulary …etc. The last chapter is related to the practical section, concerning the case of PHD students at Mohamed Khider University of Biskra. It presents the questionnaire, the methodology of the study, data analysis, and the discussion of the findings. Finally, we conclude the dissertation by general conclusion.

Chapter 1: General overview of English for specific purposes (ESP)

1.1. Introduction

ESP has attracted the intention of researchers and has come out as a new trend in ELT due to the expansion of demands for English to meet specific needs of a profession. The main aim of ESP is to suit the different learning needs and purposes of specific learners in both academic and occupational applications. In this chapter we present a set of definitions of ESP in order to clarify its meaning and issues. The next point deals with the origins, developments and types of ESP. Then, we explain the different approaches of ESP and course design. Furthermore, the chapter investigates the relationship between the ESP and needs analysis. Finally, we conclude this chapter by a conclusion.

1.2. Definitions

ESP is an acronym that stands for "English for Specific Purposes". The definition of ESP is considered as very problematic to researchers and tiring task so that it is not as easy as one may imagine to give an accurate definition of ESP (Strevens, 1987). Therefore, in the literature, different definitions of ESP are provided by the scholars. It is an enterprise that is based on three pillars of knowledge: "language, pedagogy and the students'/participants' special area of interest" (Robinson 199, p. 1). Robinson (1991, p. 2) claimed that, "students study English as a language not because they are interested in the English language or English culture as such, but because they need English for study or work purposes".

According to Belcher (2009) English for specific purposes (ESP) can be seen as the teaching and learning of English as a second or foreign language, the target aim of ESP for learners is to

use English in their domains and occupations. In its early days, teaching English for specific purposes was largely motivated by the need to communicate across languages in areas such as commerce and technology and now it has expanded to include other areas such as English for medical purposes (EMP), and English for legal purposes (ELP).

According to Widdowson (1983, p. 6), the purpose refers to the eventual practical use to which the language will be put in achieving occupational and academic aims. It is commonly "understood to be about preparing learners to use English within academic, professional or workplace environment" Basturkmen (2006, p.17).

Another definition of ESP was given by Mackay and Mountford (1978, p. 2), they acknowledge that "ESP is generally used to refer to the teaching of English for a clearly utilitarian purpose". That is to say, English may be used as a means to attain certain skills of language in real situations especially communication which enables them to use it in future profession, or to enable them understand English discourse that is related to their field of specialization (Sekhri, 2020).

For Hutchinson and Waters (1987, p.18) see ESP is not a matter of teaching 'specialized varieties' of English: "...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.". Therefore, it should not be limited to certain forms or uses of the language. Moreover, ESP has a larger aspect than teaching vocabulary or grammar for learners of a specific domain. Thus, ESP is an approach to the learning of language to satisfy learners' needs, based on the very simple question: why do these learners need to learn English, i.e., the reason behind learning English and in what field it is used. Hutchinson and Waters (1987, p. 53) further explain that "ESP is an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning". This approach to language teaching which is directed to specific and conspicuous reasons for

learning is demonstrated in a picture of tree, where we see the leaves and the branches, but there is much more to the tree than just these- much of it hidden from view inside and beneath the tree. The leaves do not just hang in the air: they are supported by a complex underlying structure. In the same way there is much more to communication than just the surface features that we read and hear.

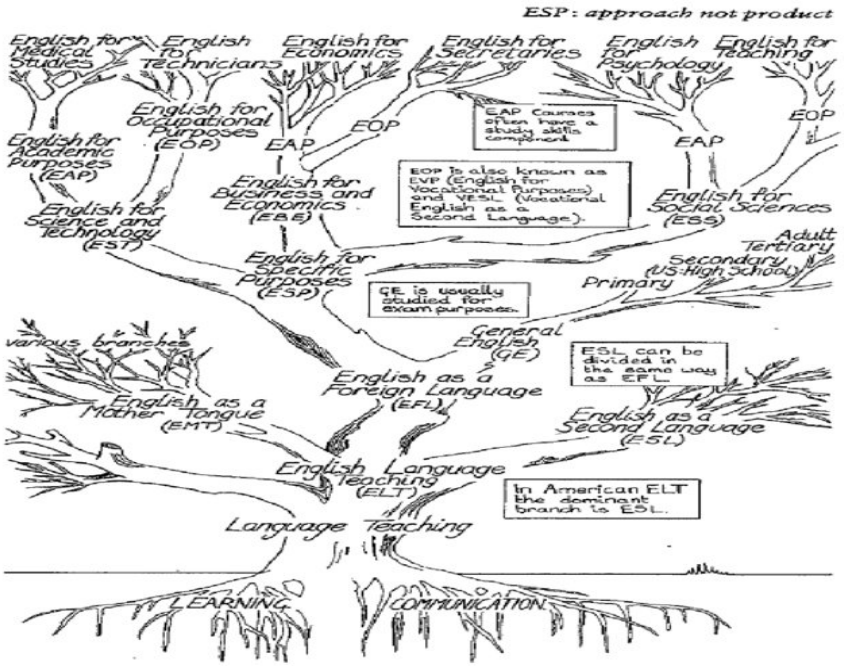

Figure 1.1: The Tree of ELT (Hutchinson and Waters, 1987)

Another definition was stated by Do and Cai (2010), they said that designing the ESP courses is based on survey results and needs analysis in order to determine the specific activities that students/learners have to do as well as the final goal they want to achieve. Therefore, English for Specific Purposes (ESP) is an English course in which the textbooks and materials are adjusted to learners' desires and purposes.

Likewise, Anthony (1997, p. 9-10) states that "some people described ESP as simply being the teaching of English for any purpose that could be specified". As a result, ESP is precisely

described as the teaching of English used in academic studies or the teaching of English for vocational or professional purposes. In other words, the role of ESP is to enable learners develop their capacities through using their language in a specific field or at workplace.

In 2001, Richards (2001) states that ESP teaching aims are: preparing non-native speaking students for study in the English-medium academic context; preparing those already fluent or who have mastered general English, but now need English for specific usage in employment, such as engineers, scientists, or nurses; responding to the needs of the materials of English for Business Purposes; and teaching immigrants the English needed to deal with their job situations. Hence in ESP, "language is learnt not for its own sake or for the sake of gaining a general education, but to smooth the path to entry or greater linguistic efficiency in academic, professional or workplace environments" Basturkmen (2006, p.18).

ESP is a recognizable activity of English Language Teaching (ELT) with some specific characteristics. In the first Japan conference on English for specific purposes (November 8th, 1996), Dudley-Evans outlined his definition to ESP and attempted to clear up the confusion among the ESP community. Two years later, Dudley-Evans and St John (1998) refined the definition of ESP in terms of absolute characteristics and variable characteristics as follows:

- **Absolute characteristics:** ESP is designed to meet specific needs of the learner and makes use of the underlying methodology and activities of the disciplines it serves. Also, it is centred on the language (grammar, lexis and register), skills, discourses and genres appropriate to these activities.
- **Variable characteristics:** ESP may be related or designed for specific disciplines and may use, in specific teaching situations, a different methodology from that of general English.

In addition, ESP is likely to be designed for adult learners, either at a tertiary level institution or in a professional work situation; it could be used for learners at secondary school level. Generally, it is designed for intermediate or advanced learners; and most ESP courses assume basic knowledge of the language system, but it can be used with beginners.

It is obvious that the absolute characteristics are specific to ESP because learners' needs are of central importance when designing language activities. Concerning the variable features, ESP courses can be designed for a specific group using definite teaching methodology, nevertheless, all learners' categories and disciplines can be concerned with ESP. For that reason, ESP should be seen simply as an 'approach' to teaching, or what Dudley-Evans and St. John illustrate as an 'attitude of mind'.

1.3. Emergence of ESP

Widdowson (1983) considers ESP as a particular sub-division of the general activity of Teaching English to Speakers of Other Languages (TESOL). The emergence of ESP has guided by many changes and challenges in applied linguistics and other related disciplines such as: educational psychology in particular. This emergence passed by three trends (Hutchinson and Waters, 1987); the demand of a brave new world, a revolution in linguistics and a focus on the learner. ESP brought new visions to course and syllabus design in terms of materials and methodology. It has also been influenced by different developments in the world of economy and politics as well as the growth of science and technology (Widdowson,1983).

In fact, The birth of ESP was the result of many factors which nearly present the same causes that, in turn, suggest a cause-effect relationship (Hutchinson and Waters, 1987).

The first is the end of World War Two when a worldwide expansion of scientific, business and technological activities was unprecedented. So, an international language, which is English,

was needed as the United States' economy dispersed as a result of post-war world. Another sub-factor of the emergence of ESP is the Oil Crises in the early 1970s that involved a massive flow of funds and western expertise into the oil-rich countries. The lack of time and money constraints created a need for cost-effective courses with accurately specific goals; on the other hand, commercial pressures began to exert an influence in the acquisition of this language. Therefore, English has become a major

Moreover, interest for most countries in the world. The raise in the number of individuals wanting to learn English in order to follow the international currencies of technology and commerce. Another main trend of the emergence of ESP was because of a revolution in linguistics. Traditionally, scholars of linguistics were called traditional grammarians; they were concerned with the description of language as it is and at a point of time, i.e., language usage or grammar. However, later they moved to language usage or what is known as modern linguistics which is interested in studying language through time (Sekhri, 2020).

Finally, the need for several countries to update their knowledge. The last was based on a new psychological development that follows the perspective of learner-centred or learning-centred approach, in which learners' attitudes, interests, needs ...etc. are the leading force of designing ESP courses (Hutchinson and Waters, 1987).

ESP, as a young movement within ELT, has come to make the balance between research and practice (Dudley-Evans and St John, 1998). The idea of putting bridges between theory and practice began in the area of Register Analysis that studied the grammatical features of scientific and technical texts carried out by Swales (1988) in his "Episodes in ESP". His work paved the path for further extended research on teaching specific linguistic areas within the frame of ELT.

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According to Dudley-Evans and St John (1998), four trends have shaped ESP growth: register analysis, discourse analysis, analysis of study skills, and analysis of learning needs. In addition to the four major trends in the development of ESP suggested by Dudley-Evans and St John (1998), Genre analysis can also be added as a noteworthy stage in its growth.

Nowadays, ESP continues to go forward focusing on involving the learner as an active agent in the syllabus design and put an emphasis on his/her needs in a move to foster individual learning, learner centeredness, and learner autonomy (Brunton 2009). Also, Brunton (2009) reports that "ESP is today more vibrant than ever with a bewildering number of terms created to fit the increasing range of occupations that have taken shelter under the ESP umbrella". The increasing attention to ESP teaching and learning was mainly a result of communication requirements and demands of the workforce in the era of globalization.

Mackay and Mountford (1987) consider ESP more than a growing field in ELT but the dominant approach to the teaching of English as a foreign language (EFL). However, certain ESP areas are currently under 'hot' discussion especially at the level of syllabus design and types of content. This has made the discipline of ESP more dynamic and increasingly progressive.

According to Dudley-Evans and St John (1998), ESP nowadays does not support one approach over the other; meanwhile, there is now acceptance of different trends to produce different types of materials and methodologies according to the teaching environment and learners' needs. The various approaches have displayed positive aspects as well as negative ones; however, the tendency towards Swales' Genre Analysis seems to gain an important position in ES P(Swales, 1990).

1.4. Types of ESP

Dudley-Evans and St. John, (1998) point out that ESP has two major types: English for General Academic Purposes (EGAP) and English for Specific Academic Purposes (ESAP).

- EGAP is the teaching of language skills that use almost the same materials like grammar and written expression;
- ESAP is related to the teaching of language skills that are related to specific fields, i.e., features that are specific for different disciplines.

Research in the field has displayed insights about the common relationship between EGAP and ESAP. For that, skills and language functions learnt in EGAP programmes may be transferred to specific disciplines in ESAP programs (Sekhri, 2020).

Researchers have not totally agreed on the two major types of ESP; most of them have divided ESP into two main subtypes which are: English for Occupational Purposes (EOP) and English for Academic purposes (EAP) (Hutchinson and Waters, 1987; Robinson, 1991) as the following figure portrays:

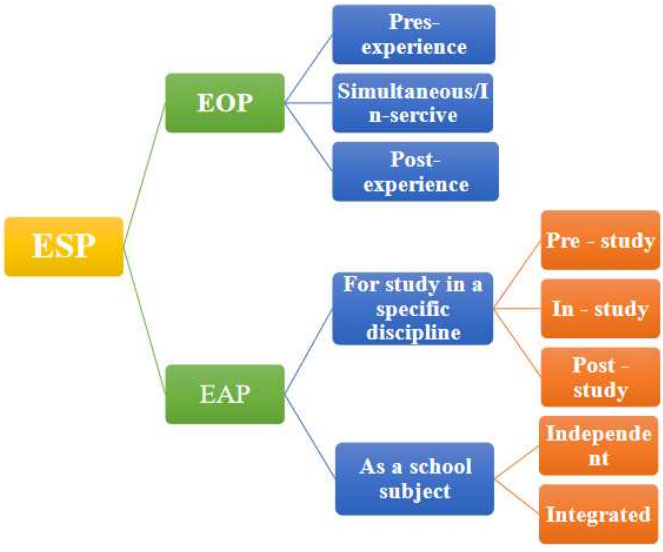

Figure I.2: ESP Classification by Experience (Robinson, 1991, p.3)

- **English for Academic Purposes** (EAP): it involves the pre-experience, simultaneous/in service and post-experience courses.
- **English for Occupational Purposes** (EOP): it is needed for studies in a specific discipline (pre-study, in-study, and post-study) or as a school subject (independent or integrated). Pre-experience or pre-study course will omit any specific work related to the actual discipline or work as students will not yet have the needed familiarity with the content; the opportunity for specific or integrated work will be provided during in service or in-study courses.

Another division of ESP qualifies EAP and EOP according to discipline or professional area in the following way:

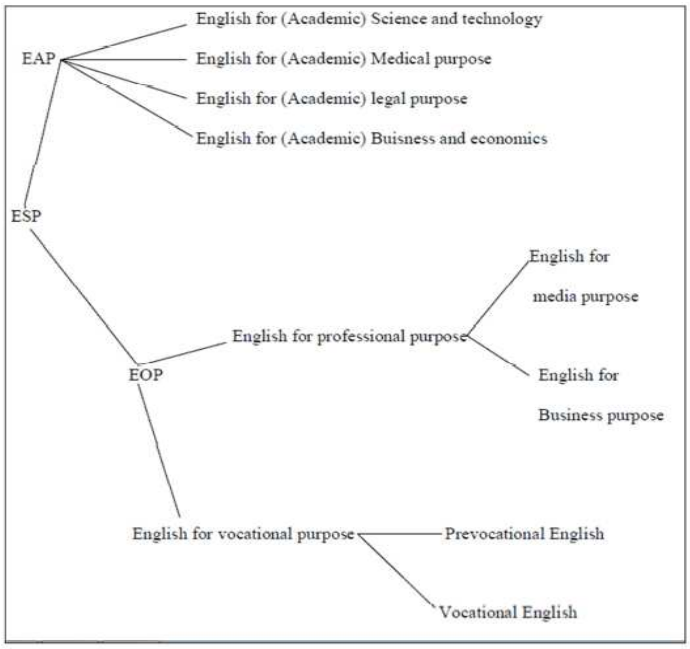

Figure 1.3: ESP Classification by Johns (1991) and Dudley-Evans and St John (1998).

In order to understand the ESP classification, Dudley-Evans and St John suggest a presentation for the whole of ELT in form of a continuum that runs from General English courses to very specific ESP courses as illustrated in Table 1.

Table 1.1:

Continuum of ELT course types (Dudley-Evans and St John, 1998).

Position 1	Position 2	Position 3	Position 4	Position 5
English for beginners	Intermediate to advance English general purposes (EGP), course with focus on particular skills	English general academic purpose (GAP), English general business purposes (EGAP), courses based common-core, language and skills not related to specific disciplines or professions	**C**ourse for broad disciplinary or professional areas, for example: report writing for scientists and engineers, medical English, legal English, negotiation/meeting, skills for business people.	1. An academics 'support' course related to a particular academic course. 2. One-to-one work with business people.

1.5. English for Specific purposes Vs. English for General Purposes

Both English for Specific Purposes (ESP) and General English (GE) are considered as two branches of (ELT). They have some similarities such as they have common concepts which are effective and efficient in learning as the major aim. Many linguists believe that ESP is derived from EGB because it incorporates specifics linguistics skills oriented to specific learners in order to improve their professional performance. Generally, teaching EGP is providing basic knowledge and skills of English language to young learners at schools level where the occupational/professional and higher educational orientations of the students are not defined

properly. Whereas, teaching ESP in various non-native /international settings is to equip learners with necessary English language skills to face their practical situation communication challenges in their future careers.

Hutchinson and Waters said that the difference between EGP and ESP is not at the theoretical level (Hutchinson and Waters, 1987).

The focus of the teacher in GE is on the syllabi, however, in ESP, he focuses on the learners' needs, i.e., the focus is more on the learning and teaching and not only the language nature. Therefore, the approach to teaching ESP is known to be learner-centred where the needs and goals of the learner are the topmost, while the teaching of GE is characterised by being language centred because the focus is on language skills and the cultural aspects of the English community (Robinson, 1980).

Furthermore, the learners of the ESP are mainly adult with a certain degree of awareness concerning their language needs (Hutchinson & Waters, 1987). Yet, GE it is specified to students whose first goal is to succeed in their examination as the GE courses are obligatory in their schools as part of their curriculum development.

General English Language teaching goes from a specific point to an iffy one, while ESP focuses on the learning process to achieve the intended objectives. "The emphasis in ESP on going from A to B in the most time- and energy efficient manner can lead to the view that ESP is an essentially practical endeavour" (Basturkmen, 2006, p. 9).

Some scholars added two other differences, ESP develops its own methodology through getting different language features from different disciplines. Its target is the needs and its general aim is to communicate effectively in the task designed according to the learners' specialty.

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ESP had been described as objective-oriented learning and EGP as aim-oriented learning because ESP deals with the development of restricted competence, on the other hand, EGP deals with the development of general capacity. Therefore, an ESP teacher is basically involved in a `training operation` equipping the learners with a `restricted competence` to cope with defined tasks, an EGP teacher, on the contrary, is involved in an `educational operation` equipping learners with a general capacity 'to cope with undefined eventualities in future'.

1.6. ESP and GE Teachers

The emergence of ESP has changed radically the status of the English teacher and the one of the English language teaching. Therefore, the researchers have debated about the differences of ESP and GE teachers. For some, it is known that ESP teachers are GE teachers using an ESP approach, i.e., they base their syllabi on needs analysis and the knowledge they have about using English in specific contexts and for specialized domains (Anthony, 1997). Similarly, ESP practitioners are only trained GE teachers who have been submitted to special training courses to teach English for specific purposes and to specific groups of learners (Strevens, 1988).

However, this point of view was criticised because most researches consider the ESP teachers are totally different from GE teachers. GE teacher is considered as the main actor who controls all that happens in the class so that the learners should obey the teacher's guidance in order to acquire the knowledge of their teacher. In ESP, the learners have more freedom to express themselves and the teacher take "a step back" when necessary (Larsen-Freeman 2000). Likewise, GE teacher prepares only for courses and evaluation.

Thus, on the one hand, GE teachers spend less effort and time than ESP teachers because these latter deal with needs analysis, syllabus design, and provision of materials, which are time consuming tasks. On the other hand, GE teachers' main concern is to focus on language

features that are grammar, syntax, phonology, morphology and so on; In spite of that, ESP teachers' main focus is to teach communicative competence whose main interest is both linguistic and sociolinguistic rules (Savignon, 1987).

In order to reach the objectives of ESP courses, teachers are required to adopt a different role and teaching strategy to transfer knowledge to their students. According to Robinson (1991) the first step for him or her is identifying the learners' needs that will, in fact, determine the method, material and the level of language teaching. So, it can be inferred that an ESP practitioner is almost a teacher of General English unless he understands and focuses upon the special needs of his/her students (Robinson, 1991).

1.7. Benefit of English for Specific Purposes (ESP)

English for Specific Purposes (ESP) provides several benefits. ESP is characterised by learning speed so that ESP results in the faster acquisition of required linguistic items. This is because it follows the pattern of native speaker acquisition of language for specific purposes, in which speakers learn what they need when they need it, inauthentic, content-based contexts.

ESP is not only focused on these patterns but also improves upon it by providing an opportunity to learn in an accelerated, intensive context. The second is learning efficiency. On an ESP, course trainees make the maximal use of their learning resources, all of which is brought to bear on acquiring specific, pre-identified linguistic items and skills. Obviously, the needs analysis is of vital importance, since it enables trainers to determine the specific requirements of teachers.

Another benefit of ESP is learning effectiveness due to the effective completion of an ESP course. Thus, the teachers of ESP are ready to use language appropriately and correctly in job-

related tasks, tasks that have been identified prior to the course by means of need analysis. Therefore, upon completion of the course, English is usable immediately in the employment context. In addition, teachers are prepared for further job-related training in English. Such preparations will give an impact on greater academic performance since no time is wasted in acquiring the necessary language.

1.8. Course Design in ESP

According to Richards et al. (2002), Course design refers to the development of a language programme or a set of teaching materials; it includes how a syllabus (procedures for deciding what will be taught in a language programme) will be carried out. It is chiefly concerned with the following items: The needed teaching methods and materials to achieve the objectives, required time, the way of sequencing and organising the classroom activities, The types of used tests and the methos of programme evaluation.

Designing ESP course, according to Hutchinson and Waters (1987), is a matter of asking a series of general and specific questions seeking answers that determine what should be implemented in the course in terms of syllabus, materials, and methodology. They believe that course designers need to know the participants and the students' reasons to learn, the setting of learning and its advantages as well as disadvantages, the amount of time allotted to the learning period, the teaching materials related to the aspects of language that should be included, the level of proficiency required and the topics that should be covered and the learning theory underlying the course and the methodology employed

Diamond (1989) claims that a typical process for language course design needs to follow these steps:

- Establish need and demand for the course

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- Establish students characteristics
- Determine content
- Set goals and objectives
- Choose teaching and assessment methods
- Implement, evaluate and adjust components as necessary

1.8.1. Approaches To ESP Course Design

Robinson (1991) sets four questions to be considered in ESP course design: How far are the existing syllabuses appropriate for ESP? How far do they offer a suitable conceptual structure within which to realise the objectives of the course? Which of the three elements (language, pedagogy, content i.e. the students' specialist subject area) is paramount? And How far do they combine?

Hutchinson and Waters (1987) suggest three dominant approaches: (1) language-centred, (2) skills-centred and (3) learning-centred.

1.8.1.1. Language centred-approach

The language-centred approach model begins with the idea of identifying learners' target situation needs aside with selecting the appropriate language theory. The analysis of learners' needs provides the language features of the target situation, and leads to elaborating the fitting syllabus that consists of teaching materials, methodology, and evaluation procedures.

However, this approach seems to have some drawbacks. Hutchinson and Waters (1987) believe that language-centred approach does not consider the learner in every step of the design process; they rather consider it as "not-learner-centred, but learner-restricted".

They also view this approach as "being static and inflexible" for it does not provide a space for feedback in case of unexpected situations such as "wrong initial analysis". Although this

approach appears to be systematic, it supports "the false belief that learning itself is systematic" (Hutchinson and Waters 1987, p.68).

1.8.1.2. Skills-Centred Approach

This approach is based on two major principles: theoretical and pragmatic (Hutchinson and Waters: 1987). The theoretical principle suggests that any language behaviour encompasses receptive and productive skills that learners should employ to produce or comprehend any written or spoken discourse. The pragmatic principles are inspired from the idea that ESP learners' objectives is to develop particular strategies and skills that will help them deal with any target discourse after the end of the course. Professional skills and communicative skills may form the focus for an ESP course in skill-centred approach (Robinson 1991). Hutchinson and Waters (1987, p.70) sets clearly the principles of this approach when he states that:

> [...] is at least realistic in concentrating on strategies and processes of making students aware of their own abilities and potentials, and motivating them to tackle target texts on their own after the end of the course, so they can continue to improve.

1.8.1.3. Learning-Centred Approach/ Learner-Centred Approach

Learning-Centred Approach is founded on the ideal that "learning is totally determined by the learner [...] and is seen as a process in which the learners use what knowledge or skills they have in order to make sense of the flow of the new information" Nurpahmi (2016). The learning-centred approach considers the learner at every stage of course design seeking the integration of all the components of the course in both the learning situation and the target situation. What makes this approach different from the two others is its dynamic nature in which feedback channels are created to respond to any unexpected situation and development. Another key difference between Learning/Learner- centred approach and other approaches is the "collaborative effort between

teachers and learners" (Nunan 1987, p. 02) in terms of decision-making, course content and teaching methods.

"Which approach is the most appropriate for ESP course?", "Which syllabus to choose?" are two frequently asked questions by ESP course designers. According to Robinson (1991), all approaches should be treated as being simultaneously available and each approach needs to be adapted to a particular situation for the simplest reason that there is no single model for an ESP course.

1.9. ESP is a Learning–centered Approach

Hutchinson and Waters (1987) described E.S.P. as a Learning-centered Approach since it doesn't emphasize language use but language learning. Both authors presented ESP with a metaphorical image (Figure n° 1) showing the relationship between ESP and ELT under the form of a tree.

> The roots of their ELT tree represent the learning communication while the trunk, the language teaching. The next division represents the English language teaching out of which three branches indicate English as a Mother Tongue (EMT), English as a Foreign Language (EFL) and English as a Second Language (ESL). The thickest of the branches, EFL, further divides into General English (GE) and English for Specific Purposes (ESP). ESP distinguishes English for Science and Technology (EST), English for Business and Economics (EBE) and English for Social Science (ESS).

Hutchinson and Waters clarified,

> The topmost branches of the tree show the level at which individual ESP courses occur". The ideas presented in this tree are clear, complete and useful for many reasons in which the English language may be thoroughly or superficially studied, depending on the learner's immediate needs.

1.10. ESP and Needs Analysis (NA)

The entire reviewed ESP literature considers NA as the 'corner stone' and the major step of ESP course design (Basturkmen, 2006; Basturkmen, 2010; Dudley-Evans and St John, 1998; Hutchinson and Waters, 1987; Jordan, 1997; Munby, 1978; & Nunan, 1988).

Needs analysis aims to determine the type of course content, materials and methodology, in addition to the characteristics of learners and their learning styles, preferences and purposes. Moreover, it deals with the description of language and the level of proficiency that will be required. It is regarded as critical to ESP despite of being used in other educational disciplines.

One of the crucial stages of ESP course design is identifying specific language and skills the group of language learners will need. The identification of language and skills is used in determining and refining the content for the ESP course. It can also be used to assess learners and learning at the end of the course. This process is termed "needs analysis". Needs is actually an umbrella term that embraces many aspects, incorporating 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.

Richards et al. (2002, p.353-354) define NA as being "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 '(for example: data from questionnaires, tests, interviews, and observation) and seeks to obtain information about:

- The situations in which a language will be used (including *who* it will be used *with).*
- The objectives and purposes for which the language is needed.

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- The types of communication that will be used (for example: written, spoken, formal, informal).
- The level of proficiency that will be required. Needs assessment is a part of curriculum development and is normally required before a syllabus can be developed for language teaching.

The practice of ESP teaching has proved that identifying learner's needs for the language "leads to a very focused course" (Dudley-Evans and St John 1998) that matches their needs to their aims, which differ from one discipline to another. NA gives language teachers insights into learners' interests and purposes of learning the language.

1.11. Review of the literature about ESP

In this paper (Bouabdallah & Bouyacoub, 2017), the authors give a clear picture of the ESP teaching and learning situation in Algeria. They started by the background of the Algerian ESP projects, then, restated the major objectives of ESP teaching. Besides, this paper presents the Algerian ESP teaching situation, the difficulties and barriers that English teachers encounter when dealing with this area of English as well as the need for change which will allow the learners to use the foreign language in their specific fields. A case in point is the teaching/learning of ESP to 1st year psychology students at Tlemcen University. The problem is that Algerian university students, and especially those of the 1st year, who have received at least seven years of formal English teaching in the middle and secondary schools still find themselves unable to use the English language, let alone make an effective use of it for specific purposes.

The use of Specific Business English Purposes training is very demanded, and there is an absence of any ESP department in the Algerian universities. The ESBP courses are normally better given by the general English teachers. Naturally, novice teachers are faced with a complex network

of issues, and finding an efficient way for professionalism is the challenge that ESBP teachers in Algeria have to face. Teachers of English for Specific Purposes courses, and thus those of Business English have often been criticized for lacking the specialist knowledge necessary for a complete comprehension of target materials' content. The purpose of the author of (Hentit, 2015) is investigating the situation of ESBP teaching in Oran, Algeria and attempts to determine the way Business English teachers manage their professional development when specific training is insufficient or unavailable.

1.12. Conclusion

The current chapter defined ESP from multi-dimensions and traced its developments from its early beginnings. ESP has various origins and roles as multidisciplinary approach so that it has several definitions that have surrounded it since its appearance. It deals with the teaching of specific content to learners in a specific area and domain. The ESP is used in diversity domain that results many branches and sub-branches of ESP which share the same ESP Objectives that concentrate on the learning process of the English language the raison why it was described as a learning centred approach.

Chapter 2: Academic writing and scientific writing

2.1. Introduction

The fourth language skill we may acquire in learning a language is “Writing”. Generally, one of the most important issues that the teachers face when working with novice researchers is developing good skills of academic writing. Academic writing has special characteristics in term of grammar, vocabulary and style and it requires several steps and processes, thus it is difficult even for native students.

Academic writing has a lot of differences comparing to a personal writing, it has its own set of rules and practices. Also, it uses a formal order, tone, style and structure in order to present ideas. The objective of academic writing is to inform rather than entertain. Therefore, the researcher is obliged to respect the academic writing rules and practices. Hence, researchers must learn and master the academic writing in order to define their academic production and their specific areas of expertise.

Scientific writing is a subtype of academic writing skills and communication skills. The novice researchers develop this skill when they are studying: writing, reading, listening, having discussions, giving and receiving feedback as well as through reflecting on their own skills. Scientific writing is a special form of academic writing, it follows a well-defined structure and it differs from academic writing in other disciplines for some defining features. These are reflected in a language that is accurate, specific, concise, clear, cautious, and objective (Aliotta, 2018).

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In this chapter, we present a general overview about academic and scientific writing and why it is considered difficult to be mastered. After this introduction, we define the academic writing and present its features, types and categories. Then, we explain the different approaches of academic writing and its difficulties. The next point is dedicated to expressing the notions related to scientific writing and its characteristics. In addition, we explain the structure of the scientific research paper and the difficulties faced by novice researchers.

2.2. Definition of Writing

Writing is a way of communication, in which one can express whatever he wants in a written form by putting letter or symbols together to form a word, then a sentence to a paragraph. In the literature, there are many definitions of writing because all scholars define writing from their own perspective but they share the same overall meaning. For example, Bensaid and Moumen (2019, p .11) defines writing as “A system that represents the language in the form of visible signs and symbols that facilitate human interaction.” Also, another interesting definition was proposed by Daniels and Bright (1996): “A system of permanent marks used to represent an utterance in such a way that it can be recovered more or less exactly without the intervention of the utterer”. Rogers (2005) stated that "writing is the use of graphic marks to represent specific linguistic utterances".

In addition, Crystal (2006, p. 257) states that “Writing is a way of communicating which is based on a system of visual marks made on some kind of surface. It is one kind of graphic expression.” Lado (1971) also represents writing as “A graphic representation of a language and information through the written medium by the use of conventional graphemes.”. Furthermore Widdowson (2001, p.62) says, “Writing is the use of visual medium to manifest the graph logical and grammatical system of the language.”. However, writing is not only a matter of presenting symbols but it is a complex process which goes through different steps. accordingly, Harmer

(2004) asserted that writing is a process that undergoes different stages. He listed four main stages that shape this process and lead to the production of a well-organized piece of writing. These stages include planning, drafting, editing, and final version. Kress (1989) said: “Learning how to write is not based on developing the mechanical ‘orthographic' skills only, but also it needs having a cognitive and social relation.”. as a summary, most the scholars agree that writing refers to presenting our ideas, thoughts and emotions using graphic representations in order to interact and communicate with other people.

2.3. Definition of academic writing

Academic writing is marketable skill that improves ones’ professional qualification, it is a demanding skill especially at the tertiary level. The definition of the academic writing in the dictionary is simply: “an essay, thesis, report, journal article or any other written document which has the purpose of educating the reader or achieving some scholarly aim for the writer”. Academic writing is any writing done to satisfy a requirement of a school or university.

In order to give an accurate definition of the term academic writing, many efforts have been made by scholars. These definitions differ in accordance with the context in which they are delivered. Hogue (2008, p .2) sees that the kind of writing you will do in the class is called academic writing because it is the kind of writing you do in college classes. Every kind of writing has a particular purpose and a particular audience. The purpose of academic writing is to explain something or to give information about something. Its audience is your teacher and your classmates. Murray (2008) asserts, “Academic writing is that set of conventions we see in a thesis or a published paper in our disciplines, a definition that becomes more precise once you scrutinize examples of published writing in your target journal.”

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From theses previous definitions, academic writing is the type of writing that takes place in academic institutions with specific purpose and audience. Moreover, it requires a set of conventions to be followed such as in thesis, dissertations, research papers and articles.

Hyland (2002) introduced another definition: "academic writing is like all the forms of communication, is an act of identity: it not only conveys disciplinary 'content' but also carries a representation of the writer. He meant that academic writing does not just revolve around (as a) conveying an ideational 'content', but it is also about the representation of self-awareness".

Oshima and Hogue (2007, p .3) points that "Academic writing is the type of writing used in high school and college class, it is unlike creative writing which is the kind of writing you do when you write stories, nor like personal writing, which is the kind of writing you do when you write letters or e-mails to your friends and family."

According to the definitions above, academic writing is a particular kind of writing that someone present his self-awareness not only for presenting a content. In addition, it does not related to write stories or personal writing: family letters and emails…etc but it is concerned with in classes writing.

In addition, Whitaker claims that Academic writing is essentially the writing you have to do for your university courses, she said that "Instructors may have different names for academic writing assignments, but all of these assignments have the same goal and principles" (Whitaker, 2009). Therefore, academic writing deals with every kind of writing that is related academic topic such as: essay, paper, research papers, term paper, argumentative paper/essay, analysis paper/essay, informative essay, position paper…etc.

Hartley gave an academic definition of academic writing: "Academic writing refers to a style of expression that researchers use to define the intellectual boundaries of their disciplines and their

specific areas of expertise" (Hartley, 2008). Thus, the researcher uses the academic writing for the sake of presenting scientific production. As a summary, we can say that academic writing is a kind of writing that requires particular rules and practices that are different from the other kinds of writings.

According the definition presented above, academic writing is a type of writing that is restricted by several rules, styles and characteristics; and it is a kind of writing that the researchers and students use schools or universities during the learning process. It can be in a form of textbooks, dissertations, or journal articles.

The importance of learning academic writing is the same as all kinds of writing, which is to communicate, but the communication we are highlighting here is more academic, formal, and scientific. A clearly written assignment lets the thought shine while giving a precise understanding of the branch that the researcher is a part of, along with the scientific message that he intends to deliver.

2.4. Features of academic writing

Academic writing is a formal style of writing that provides information about a particular topic and it is used in universities and scholarly publications. Researchers are asked to use academic scientific style when writing their researches (essays, research papers, thesis and dissertation) to be published in journal and books…etc.

Formal and unbiased: Academic writing aims to convey information in an impartial way. The goal is to base arguments on the evidence under consideration, not the author's preconceptions. All claims should be supported with relevant evidence, not just asserted. The formal style used in academic writing ensures that research is presented consistently across

different texts, so that studies can be objectively assessed and compared with other researches Mathew (2016).

Evidence: Evidence is a distinctive feature of writing academically. Writers are expected to support their work with well-informed evidence and arguments. According to Mathew (2016), evidence could be extracted from past researches, case studies or secondary sources. Moreover, evidence can be in form of facts, statistics, and scholars' opinions. It is a tool to increase the credibility of the writing.

Clear and precise: It's important to use clear and precise language to ensure that your reader knows exactly what you mean. This means being as specific as possible and avoiding vague language(Carroll 1990; Starkey, 2004).

Focused and well structured: An academic text is not just a collection of ideas about a topic, it needs to have a clear purpose. Start with a relevant research question or thesis statement, and use it to develop a focused argument. Only include information that is relevant to your overall purpose. A coherent structure is crucial to organize your ideas. Pay attention to structure at three levels: the structure of the whole text, paragraph structure, and sentence structure (Hammond and Martala, 2009).

Well sourced and referenced: Academic writing uses sources to support its claims. Sources are other texts written by other academics. It's important to consider which sources are credible and appropriate to use in academic writing. For example, citing Wikipedia is typically discouraged. Don't rely on websites for information; instead, use academic databases and your university library to find credible sources.

Correct and consistent: As well as following the rules of grammar, punctuation and citation, it's important to consistently apply stylistic conventions Carroll (1990).

Moreover, we can list these features; formal vocabulary, formal verbs, full verbs, formal grammar structures, statements, impersonal language, preciseness, reference and evidence, and transition words. In addition, in academic writing, we do not use: first personal pronoun, contractions, archaic terms, slang, clichés, qualifiers (really, very, rarely, often ...etc.), overused "scholarly" phrases.

2.5. Categories of Academic Writing

The aim of using an academic writing is expressing our ideas, thoughts, intellectual needs and scientific findings in clear, concise, precise and formal academic way. Academic writing can be grouped into six basic categories: essay, research paper, research article, dissertation, thesis, and technical report.

2.5.1. Essay

Writing an essay requires using a defined structure: an introduction, a body and a conclusion, also the essay has a topic and uses evidence in research, in order to give a conclusion. The objective of the essay is to express the ideas using texts by describing or summarizing a topic to achieve an important analysis. Moreover, one should give a set of arguments, evidence and reasons in order to answer the topic question (Amrate, 2019).

2.5.2. Research Paper

Research paper is a substantial piece of academic writing, usually done as a requirement for a class, in which the author does independent research into a topic and writes a description of the findings of that research. Rosemary said that "a research paper is a form of written communication. Like other kinds of nonfiction writing-letters, memos, reports, essays, articles, books-it should present information and ideas clearly and effectively" (Rosemary, 2009). The purpose of research

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papers requires writers to locate information about a topic that is, to conduct research, take a stand on that topic, and provide support or evidence for that position in an organized report.

2.5.3. Research Article

A scientific or research article or paper is a technical document that describes a significant experimental, theoretical or observational extension of current knowledge, or advances in the practical application of known principles (O'Conner & Woodford, 1976). A research article has to present research findings that are valid and previously unpublished (original), as well as add some new understanding, observation, proofs, and potentially important information (Gordon, 1983). An article is a piece of writing that is published in in a peer-reviewed scholarly journal, newspaper or magazine. it reports the methods and results of an original study and contribution performed by the authors in a given area. Research articles had only a limited audience consisting mainly of other scholars and graduate students (Hengl, 2002).

2.5.4. Dissertation

The dissertation is written, especially, to get a university degree or diploma. It is considered a long essay on a particular subject. Therefore, researcher of the dissertation have to take responsibility for studying the research field and produce a literature review. Moreover, he chooses a method for undertaking a study, write up your findings and discuss the outcomes in a discussion section. The student develops intellectual independence in depth in a topic of interest. In other words, dissertation is simply a document submitted in support of candidature for an academic degree or professional qualification (Amrate, 2019).

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2.5.5. Thesis

A thesis is an idea or theory that is expressed as a statement and is discussed in a logical way. More specifically, a thesis is a requirement for higher-level degree programs and is a preliminary requirement for attaining a degree and graduate in honours. Internationally, a thesis is usually referred to a doctoral degree or PhD, also known as a “dissertation”. In other words, a thesis is a long piece of writing on a particular subject, especially one that is done for a higher college or university degree and it is the main idea, opinion, or theory of a person, group, piece of writing, or speech (Amrate, 2019).

2.5.6. Technical Report

A technical report is related to projects, it is a document written by a researcher detailing the found results and submitted to the sponsor of that project. Technical reports may be published before the corresponding journal literature and the content may be more detailed than the corresponding journal literature, although there may be less background information since the sponsor already knows it. Benjamin said, "the intent of a technical report is to communicate an idea/problem to a reader effectively" (Benjamin, 2001). In addition, technical reports are usually not peer reviewed unless the report is separately published as journal literature classified and export-controlled reports have restricted access.

2.6. Academic writing difficulties

The objective of writing is to communicate our thoughts, sending information and expressing ideas. But it is difficult to master how to clearly share our ideas using texts especially using the foreign languages. Farbrain and Whinch (1996, p.32) reveals that writing “Is about conveying meaning by using words that have been chosen and put together in written or printed form.”. On the other hand, Richard (1990, p.100) believes that : “Learning to write either in the first language

or in the target language is one of the difficult tasks a learner may face.". Eltayeb (2019, p.63) also agrees on the same idea that "writing is a generally difficult skill because writing is not a spontaneous activity but has to be learned.". From these citations, we conclude that the writing skill in general is difficult one for leaners and they need to learn and practice it because it is not something innate.

Teachers and students of foreign language face certain problems in teaching and learning writing. In fact, Nunan (1999) considers as an enormous challenge to produce "a coherent, fluent, extended piece of writing" in one's second language. Some of the reasons that guide to the difficulties of writing are: Poor proficiency of language, the field of writing, Lack of motivation, Lack of practice, Inadequate time, Teacher feedback.

The main reasons why learner's writing may be difficult to understand or defective in some other way (Coe & Rycroft, 2000):

The punctuation of the sentence is not clear for example the use of commas and full stops without any good reason or the missing of punctuation where it necessary. Moreover, the idea may not have been presented in an order that easily makes sense to the reader and the relation between the ideas may not be clear because of the absence, or inappropriate use, of linking words and phrases, such as although, for example, lastly, on the other hand, and so on. In addition, the attitude of the writer is not clear: is he or she describing, suggesting or criticizing something?

Sometimes the writer does not put the ideas grouped together into distinct paragraphs, or he may begin practically every sentence on a new line. Again, a paragraph-or a longer text-may not begin with an introduction that leads the reader in the right direction. Also, a text may contain ideas that are not really relevant to what the writer wants to express, or the writer may find it difficult to think of enough ideas (Coe & Rycroft, 2000). To put it simply, it is important for

learners to practice in combining the separate skills in one compete, well- written text (Coe & Rycroft, 2000).

2.7. Writing Approaches

Writing is not based only on one method or one approach so that there are many approaches of writing. Each approach is used in particular context and needs. According to Namoushi (2014, p .32): "Teachers and students have become aware of the fact that writing takes particular forms in different contexts, a great number of approaches of teaching have come out." He adds "None of these approaches considered as ideal, they have all proved to be successful in one period or another". The main approaches used in teaching writing are process approach, product approach, genre approach, and process-genre approach.

2.7.1. Product approach

With the product approach, teachers focus on what a final piece of writing will look like and measure it against criteria of "vocabulary use, grammatical use, and mechanical considerations such as spelling and punctuation, as well as content and organization" (Brown 1989, p. 320). A product approach is "A traditional approach in which students are encouraged to mimic a model text, usually is presented and analysed at an early stage." (Gabrielatos, 2002, p .5). Moreover, "Writing in this approach serves to reinforce writing in second or foreign language in terms of grammatical and syntactic forms." (as cited in Ghufron, 2016). The normal procedure is to assign a piece of writing, collect it, and then return it for further revision with the errors either corrected or marked for the student to do the corrections (Raimes, 1983).

2.7.2. Process approach

While the product approach focuses more on the writing tasks, the process approach emphasizes on the steps of how creating a piece of writing. In the mid-1970s, the process approach

began to replace the product approach which identifies four stages in writing: (1) prewriting, (2) composing/drafting, (3) revising, and (4) editing (Tribble, 1996). These stages are recursive, or nonlinear, and can interact with each other throughout the writing process so that we can return from further stage to previous one. This approach focuses on the revision and the feedback of others. For the early stages, this approach does not concentrate on the correction of spelling and punctuation.

2.7.3. Genre approach

The genre approach became popular in the 1980s. It focuses on teaching the student writers different types of written texts. The genre approach focusses not only on the content, but also on the context. According to Namoushi (2014, p .44) the genre approach is mainly concerned on teaching particular genres that students need control of in order to succeed in specific situations, this put emphasis on the content of text as well as the context in which the text is produced. As Nunan (1999, p. 280) explained, different genres of writing "are typified by a particular structure and by grammatical forms that reflect the communicative purpose of the genre." According to Cope & Kalantzis (2001), the genre approach to writing consists of three phases: (1) the target genre is modelled for the students, (2) a text is jointly constructed by the teacher and students, and (3) a text is independently constructed by each student. In (Badge &White, 2000), the authors said that this approach acknowledges that writing takes place in a social situation, reflects a particular purpose, and that learning can happen consciously through imitation and analysis, which facilitates explicit instruction.

The genre approach has been criticized because it undervalues the processes needed to produce a text and sees learners as largely passive. The genre approach succeeds at showing

students how different discourses require different structures. In addition, introducing authentic texts enhances student involvement and brings relevance to the writing process.

2.7.4. Process Genre approach

Several writing teachers recognize that we need not rigidly adopt just one approach in the writing classroom. Therefore, some cases require the combination between the previous approaches which results important outcomes. This new way of thinking about writing helps student to benefit from the strength points of the combined approaches. One example is a synthesis of the process and the genre approaches, which termed the process genre approach. This approach allows students to study the relationship between purpose and form for a particular genre as they use the recursive processes of prewriting, drafting, revision, and editing. Using these steps develops students' awareness of different text types and of the composing process (Badge & White, 2000).

2.8. Scientific writing

The scientific writing is a kind of academic writing that has its characteristics and methodologies that distinguish it from other writings. Researchers in scientific fields write their researches papers and articles in order to communicates their studies, contributions, ideas with others scientists. However, scholars should follow and consider many things in order to have clear, effective piece of writing that is understood by the target audience following such requirements (Tanti, 2014).

English is considered the most important language of many domains such as: science, economy, education, …etc. It has been used as lingua franca (ELF) and as an international language of sciences (EILS). Lillis and Curry (2010, p.1) state that: "[English is] considered by prestigious institutions to be the global language of science and by many participants in text

production–scholars, reviewers, translators, scientific journal editors–as the default language of science, academic research and dissemination" (p.1).

Publishing is a crucial part of doing research. Yet, many students and other inexperienced writers often struggle with learning the skills required for good academic writing, while their supervisors or other experienced academics often lack the time to provide much needed guidance. As a result, students frequently lament a sense of overwhelming and anxiety that hinders their progress and prevents them from approaching writing with confidence and ease.

2.8.1. Definition of scientific writing

Scientific writing is a type of writing that has its specific characteristics such as using technical words related to the field. According to Gastel and Day (2016): The scientific writing usually reports original research in journals, using scientific papers in standard format. More generally, scientific writing also includes communication about science through other types of journal articles, such as review papers summarizing and integrating previously published research. It includes other types of professional communication by scientists—for example, grant proposals, oral presentations, and poster presentations. Related endeavours include writing about science for the public, sometimes called science writing.

In addition, scientific writing allows researchers to publish their findings in journals or in any sort of media in which it follows international requirements of writing. Another interesting definition presented by Peats (2002, p.8) : "scientific writing is a well-defined technique rather than a creative art. The three basic aspects to effective scientific writing are thought, structure, and style" .

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2.8.2. Characteristics of scientific writing

The published scientific papers in conferences and journals, generally, are related to specific domain, use a specific language and style and follow systematic structure. In addition, researchers distribute their gatherings to share thoughts that are identified with the field following a methodical construction and explicit language style. According to Schuster, Osvaldo, Oleveira, and Zucolotto (2014), scientific writing has the following characteristics: Its Focus on specific areas of research and aims is share the new findings related to the field. Also, it has systematic structure and traditional format. And uses specific language and style. Moreover, it demonstrates creativity by ideas and concepts and specifies what each section should contain guidelines

The remarkable feature of EST discourse is that it attaches great importance to the coherence of narrative logic and the clarity of expression, and accurately expresses scientific facts through its strict logic and objective description (Ren, 2009, p.124-126). There is also a clear pattern in the text structure of scientific and technological texts, and the language program and style are basically unchanged.

The principal characteristics of the scientific discourse are (Tahan, 2022):

- **Impersonal:** to give more credibility and convey its objective nature, it avoids the use of first personal singular and plural pronouns.
- **Objective:** it does not issue personal opinions, it avoids the use of subjective elements, it is based on observations about the results obtained through scientific tests.
- **Concise:** the scientists say what they want to say using only the number of words needed to explain the idea.

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- **Precise:** it is careful to say exactly what is meant, it requires the use of simple phrases sequencing and verb tenses.
- **Clear:** another outstanding feature of scientific discourse is the clarity with which the research is presented. Therefore, precision must prevail so that there is no confusion in the approaches and the results are easy to understand for the recipient. Clarity implies that ideas are presented in an orderly and hierarchical manner.
- **Language:** the language of scientific discourse uses words and concepts of a technical nature and referring to each particular science. That is, the communicative code is adjusted to each area that is being dealt with, be it physics, chemistry, mathematics or other branches of science. In this type of text, it is common to use neologisms or new terms that facilitate the explanation of the elements of the investigation. For their part, the new words have contributed to the enrichment of the different languages and a better understanding of the environment.
- **Graphics**: in scientific discourse, the use of graphs, diagrams and drawings is common to complement the information that has been collected during the investigation. They describe, explain and expose the data in a universal language that facilitates the understanding of what has been studied and at the same time they record antecedents for future research.
- **Analysis and systematicity:** The analysis has to do with the study of the elements that make up the phenomenon that is being observed and described, what causes it and what effects it has on the environment in which it develops. In other words: origin-action-repercussion. With regard to “systematicity”, it is so called because it

is linked to “system”. The objective of this aspect is to demonstrate that a scientific fact is real by how the components that cause said phenomenon interact. Together, the systematicity and the analysis help to discard the doubts that arise in the elaboration of the scientific discourse and strengthen the results obtained in the investigations.

- It deals with specific topic and it is oriented to the expert audience in the subject matter (jargon English). It uses codes and specific terms with high density of specialism.

2.8.3. Rules of scientific language

According to Tischler (2005) the rules of scientific writing are as follows: It tries to interest, inform, and persuade the reader and it is for the reader and write clearly. Scientific writing avoids: redundancy, digressions, over explain, overstatement, indefinite "this", and unnecessary qualifiers. Moreover, it uses consistent tenses, precise word, simpler and concrete words, examples, simpler sentences, transitions, and active voice (except generally in methods). Scientific writing uses affirmative rather than negative constructions and cites sources as well as findings. In scientific writing, proofread and spell check are necessary.

In general, the best writing is simple and direct. Writing that is simple and direct is most easily understood. It also tends to be the most forceful and memorable. Use no more words than necessary and never use a complicated word if a simpler one will do just as well. Many people seem to feel that writing in a complicated way makes one sound serious, scholarly and authoritative. While this type of writing may sound serious, it is no more authoritative than writing that is simple and direct. Certainly, it is more difficult to understand. Often, it sounds pompous

and overbearing. If your purpose is to be understood in a way that is both forceful and memorable, adopt a style that is simple and direct (Tischler, 2005).

2.8.4. Role of scientific language

Scientific language has its particular pragmatic, syntactic and lexical traits. It is used by the community that shares some objectives and is involved in a scientific activity. The scientific language is perceived as transdisciplinary and it doesn't relate to the objects involved in the scientific activity. It relates to the discourse, which in turn refers to the objects and scientific procedures.

A scientific language plays a highly important role due to the fact that it enables the author to maintain contact with a reader. Ability to write and speak in a clear and interesting manner is a very difficult ability. Understanding of each utterance depends on the author, their word usage and guidance abilities. A good author is able to create a superb text or speech in such a way that he guides the reader and facilitates the comprehension of the text.

The vocabulary is not devoted to one particular discipline, it can be shared by various ones. The meta-discursive and meta-scientific phraseology is used to describe the process and the way of author's reasoning. Scientific expressions typology proposed by Scientext depends on roles which the expressions fulfill in a text. This typology should be based on the following traits:

- its criteria have to be clearly defined and functional for linguistic study
- it needs to be quite intuitive, mostly for semantic and didactic processes
- it has to be precise

2.8.5. The Typical Structure of a Scientific Paper

The format of the scientific paper is specific and contain a set of components: According to Schuster, Osvaldo, Oleveira, and Zucolotto (2014), the format of a scientific paper usually includes:

Writing scientific research papers

- **The title:** it is the first element to catch the reader's eye before reading any piece of writing. A good title should be informatics, catchy, not too long or too short. Therefore, it is a short sentence, specific enough to describe the contents of the paper. It should succinctly convey the focus of the study and the scope of the paper. The title should be appropriate for the intended audience, which solves the problem to attract the potential readers' attention.
- **The authors'** names, affiliations, and their contact data. The author is person who did the work and wrote the paper is generally listed as the first author of a research paper. For published articles, other people who made substantial contributions to the work are also listed as authors.
- **The abstract:** short summary of the paper, it should "set the stage" by characterising the issue the paper will examine and summing up the commitments of the paper toward taking care of that issue. It gives the reader a "preview" of what's to come. The abstract allows other scientists to quickly scan the large scientific literature, and decide which articles they want to read in depth. Bhakar and Sikawar (2014) asserted that a useful abstract should contain the following elements: motivation, problem, solution, results, and implication that do exist within the paper.
- **Introduction:** It is an explanation of the topic of the paper introduced in a careful smooth way. It makes way for the remainder of the paper. It is more detailed description of the background and the problem. It presents what question did the author asks in his experiment? Why is it interesting? The introduction summarizes the relevant literature so that the reader will understand why the authors were interested in the question you asked. The introduction is a crucial element in that it attracts the reader and helps in understanding the topic and the reasons behind choosing it.

Writing scientific research papers

- **Methods and Materials:** the authors ought to give all the necessary details to make their research reproducible, making it feasible to anybody with equivalent foundation, readiness, and framework to repeat or to imitate the investigation or trials. This is a typical logical approach to check (or invalidate) detailed outcomes.
- **Results and Discussion**: it deals with presentation of the data, interpretation, and discussion of the results. It refers to the conclusion section; it leads the reader from too specific results to more general conclusions. According to Day (1983) and Swales (1993), the discussion part includes the followings: A brief summary of the result in form of discussion and comparison of the results with previous studies,
- **Conclusions:** What can one conclude from the findings?
- **References:** it refers to all the sources used during the research process including books, articles, lectures…etc. Depending on the author's style, the references are cited in different ways on the basis of various citation formats.

2.8.6. Models of scientific writing

In the literature there are several models of scientific writing in order to write and publish a good scientific paper. Osvaldo, Oliveira, and Zucolotto (2014, p. 228) claimed about the model: "It identifies typical rhetorical moves used in the introduction section of scientific papers in English. These moves can also describe the structure of a typical abstract, which itself summarizes the content (and sections) described in the Introduction". The most known models are : the Swales Model, The CARS Model (Creating A Research Space), Alouisio and Oliveira'S Model, The Weissberg and Buker Model.

The CARS model (developed by Swales) relates the research enterprise to the struggle of a species to carve out an ecological space for itself in a competitive environment, and presents

researchers as struggling for recognition and acceptance in a highly competitive research environment (Swales, 1990). In other words, scholars attempt to establish a research territory by making rhetorical moves (claiming centrality and/or making topic generalizations, along with a review of prior literature) that indicate that the topic of research is pertinent and constitutes part of a well-established research area (Adika, 2014).

2.8.7. Difficulties of scientific writing

Writing a scientific paper is not an easy task because there are many things should be taken in consideration. Also, they have the responsibility to record their findings in the right way to be understood to the target audience, and they seek to write their research within specific aspects in order to make their writings effective, comprehensible and clear such as punctuation marks and spelling checks …etc. Barrass (2002) argue that besides teaching science, it is need also to develop learners' skills because it would help them in both study and employment. Teaching them how to utilize techniques and instruments that they may never use in their working lives could not able them to express their thoughts clearly and simply in writing. This is something they should do each day as working researchers and specialists because writing well makes scientists being better in achieving higher grades in course work and assessments, and be more effective in their careers. The power of rightly chosen words is essential skill that should be developed to express our thoughts in writing, as clearly and simply.

The scientific writing depends on the type of journal and their target audience and the misuse of punctuations leads to misunderstanding of the presented ideas. The punctuation marks that are often used improperly, most notably the comma (,); the semicolon (;); the colon (:); the hyphen (-); and the apostrophe ('). Spelling and punctuation are two commonly shared writing difficulties

among scholars. Learning to spell words correctly is expected to occur during the earliest stages during research, yet it is not always the case for spelling may become difficult in some instances.

The structure of a scientific manuscript is different from other forms of writing. It is not an easy task to learn and master and usually takes time. Too many grammatical errors make it difficult to assess the content of a manuscript. Getting one's idea across the reader is of utmost importance, and grammatical errors may send across the wrong or unclear message. Al Fadda (2012) found out that the main challenges ESL students encounter are differentiating between written and spoken words and phrases, reviewing grammar including subject-verb agreement and joining sentences together to make a coherent paragraph. Generating ideas about their topics could be also a barrier that hinders students to move on in their writing (Al Murshidi, 2014). Another concern is to read and then to write in their own words. This could lead to grammar mistakes which may make students reluctant to paraphrase and summarize other's work (Amin & Alamin, 2012); instead, they just copy and paste.

2.8.8. Research Paper

Research paper is a form of research used in teaching and learning settings. Many definitions have been proposed for research paper but they share the idea of being an academic activity. The definition proposed by Rozakis (2007): research paper involves with presenting a thesis with arguments in a form of an analytical essay to evaluate a position and persuade the readers. Moreover, he gives the difference between research paper and paper; the latter collects only facts without arguing them serving as a summary. Bhakar and Sikarwar (2014) argued that research paper is more than a collection of information or sources, but it analyses a specific point and argues it. Therefore, a research paper tried to find a conclusion about a topic by using the previous works about the same topic. Research paper is a form of research used in the teaching/ learning context

as an effective tool of assessment. Thus, writing a research paper requires a set of steps starting by reviewing the literature about the topic, and then writes an essay in which one draws conclusions about that topic (Rozakis, 2007). Winkler and Metherell (2011) defined the research paper or library paper in a form of a process which involves the following steps; gathering information about a topic, taking a stand, and backing it with opinions of others. Research paper is a systematic process which deals with presenting your thoughts supported by others work.

According to Shewan (2000), the principal steps that one should follow when writing a research paper, are: First of all, the writer has to select an appropriate topic and gather initial resources and preparing a "list of reference"; then, determine the thesis statement, targeted audience and a general outline. The researcher should conduct detailed library research by reading and taking notes and prepare a detailed outline from note cards and write the first draft. The next step is to make further research, if necessary, then start writing a second draft. The next step is for typing the paper and proofreading it. Finally, the researcher produces the final draft.

2.8.8.1. Structure of Research Paper

There is not only one type and one format for the research paper. For novice researchers, it is not easy to organise their research papers. However, all research papers share one common layout composed of three main parts namely: introduction, body, and discussion.

To start, the introduction provides a broad overview about the subject and the questions to be answered in the body section. Moreover, the content of the paper, methods, results are to be presented in details in the body section. Finally, the discussion section which is devoted to, as the name suggests, to the discussion of the study results and findings. The figure 2.1 illustrates the structure of a research paper and all its parts that flow logically from general to very specific till the conclusion. By reaching the conclusion, the opening starts again.

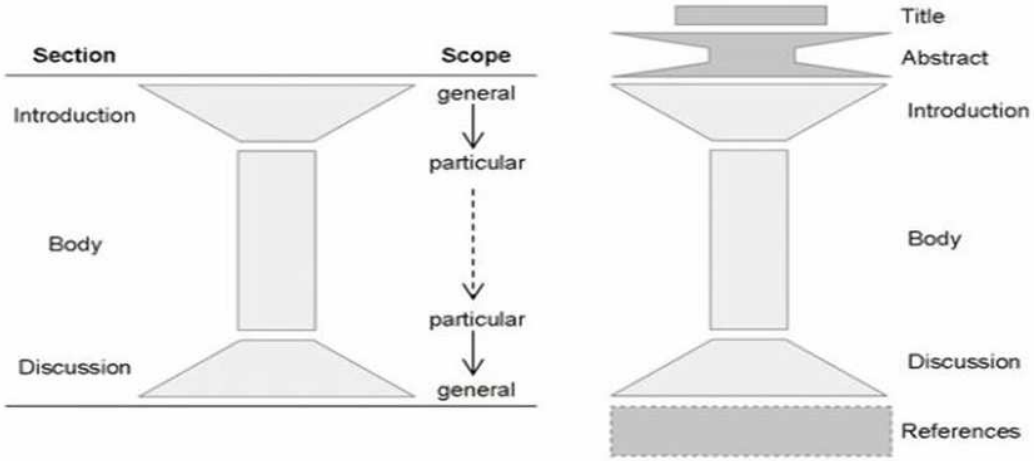

Figure 2.1: Research paper structure (Bhakar & Sikawar, 2014).

2.9. English for Research and Publication Purposes (ERPP)

There has been growing interest in the last few decades among academics to publish in mainstream indexed journals. Many factors have resulted in this publish competition (Van Dalen & Henkens, 2012). The necessity for researchers of writing for publication is due to several objectives such as: gain experience in the field of study, as well as to obtain a promotion, prove themselves and demonstrate their scientific and cultural level through years of research and work. Therefore, interest in international publication has been increasingly well documented and has even resulted in the introduction of a new term in English for Academic Purposes (EAP): English for Research Publication Purposes (ERPP), leading to a special issue on ERPP in the Journal of English for Academic Purposes in 2008 (Adjadj, 2018). Cargill and Burgess (2008) have defined ERPP as: English for Research Publication Purposes (ERPP) can be thought of as a branch of EAP addressing the concerns of professional researchers and postgraduate students, who need to publish in peer-reviewed international journal. While EAP programs in universities can address some of these needs in a general way, the real-life, specific issues for academics, whose L1 is not English wishing to publish in English, are often broader and more Complex.

Writing scientific research papers

As Ammon (2007) points out, networked scholars, because of their greater facility in using English, may take on more gatekeeping functions and establish rules for scientific publication. According to the commonly used principle of the survival of the fittest, only researchers who are best adapted to the expectations of these Anglophone journals are likely to survive in this English only competition. This is mainly because getting acceptance in an indexed international journal entails having scientific manuscripts undergo a peer review process whereby the novelty, significance, and credibility of authors' claims, and the scientific quality and rigor of the manuscripts are evaluated (Flowerdew, 2001; McKay, 2003).

Belcher (2007) tried to investigate the reasons of accepting and rejection manuscripts by peer reviewing process, he examined the submission history of an applied linguistics journal. The results of his study found that language use and style are the most frequently highlighted aspect, with 90% of the critical commentary from the reviewers.

In order to find out the most frequent linguistic problems they face when writing a scientific paper, Mungra and Webber (2010) investigated medical research manuscripts of Italian NNSE researchers. The result of this investigation was as follows: the most frequent problem is technical content, followed by lexical and grammatical use of language, clarity, and verbosity. This result is related to the role of referees to critique the technical content of the manuscript, rather than the use of language.

Flowerdew (2013) proposed two categories of ERPP: discourse analysis (product-oriented research) and situated learning theory-informed (process-oriented research). Then, he proposed the third one that is research articles (RA) genre works are essential in ESP research, especially Swales' model for RA's introductions. Therefore, ESP research is concerned with the description of rhetorical and linguistic aspects of RAs Genre under the labels of 'genre analysis, corpus-based

discourse analysis, and contrastive rhetoric'. The importance and the significance of these studies of ERPP is helping the researchers to write successfully their research papers (Flowerdew, 2013). Moreover, Flowerdew said that the most researched features include the schematic structure, the prototypical structural patterns that make up the genre and its parts, lexico-grammar and how the parts (moves) as well as politeness and citation conventions are realized linguistically (Flowerdew, 2013).

Since Flowerdew is an academic papers' reviewer, he presented the most specific difficulties with academic writing among others as follows: grammar, use of citations, making reference to the published literature, structuring of argument, textual organization, relating text to audience, ways in which to make knowledge claims, ways in which to reveal or conceal the point of view of the author, use of 'hedges' to indicate caution expected by the academic community and 'interference' of different cultural views regarding the nature of academic processes (Flowerdew, 1999b). However, He claimed that the problem od grammar can be overcome by second-language specialists and journal editors and reviewers" so that the abstract patterns are more problematic than grammatical features 'surface errors' (Flowerdew, 1999b).

2.10. Importance and basic aspect of publication

Researchers publish their scientific works for many reasons and objectives that serve to them either in the academic world or to their personal life. In addition, Researchers' target audience could be waiting for their recent findings in order to get benefits. According to Osvaldo, Oliveira, Schuster and Zucolotto (2014), through publishing in all sorts of media, researchers find themselves responsible and at the same time aiming to share their ideas and findings of research with the scientific community and with the world as well.

Writing scientific research papers

Scientists communicate the fruits of their labour mostly in writing, and mostly in scientific journals, conferences and other forms of verbal communication. Jennifer Peats (2002) mainly researchers publish because: job promotion, the publication of researchers' scientific article in well-respected journal is considered an achievement, publications are imperative for career advancement and for the economic survival of research departments and finally, the number of successful publications measures research productivity.

The researchers should take into account some crucial elements of scientific research when writing their scientific papers so that the content would be comprehensible and effective at the same time. Peats defined the scientific writing as follows: "a well-defined technique rather than a creative art. The three basic aspects to effective scientific writing are thought, structure, and style" (Peats, 2002): 1) Thought is a matter of having some worthwhile results and ideas to publish. You need some new results to publish and you need to be able to interpret them correctly, 2) Structure is simply a matter of getting the right things in the right place, 3) Style is a matter of choosing the fewest and most appropriate words and using the rules of good grammar. When you ask for feedback on the thoughts and structure of your paper, you are asking for a macro-review of the basic content.

Moreover, the poor style of expressions and grammar of writing research papers lead make them unlikely to appeal to editors, reviewers, or fellow scientists, and are unlikely to be published in a good journal.

2.11. Scientific publication trends in Algeria

The growing of number of publications of Algerian researchers is very important from year to another. Statistics from DGRSDT (2017) shows this increasingly growing of scientific publications in all disciplines both at the national and international levels between 2000 and 2016 (see Figure 2.1). The production of research papers has respectively expanded from publications in 2016, representing a rise of 1125% (as cited in Adjadj, 2018).

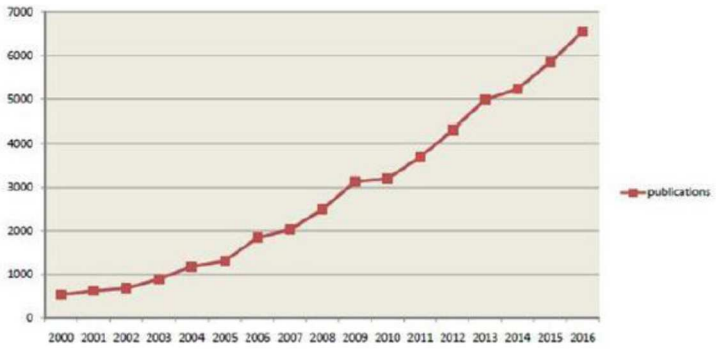

Figure 2.2: Statistics of scientific publications in Algeria in all disciplines both at the national and international.

2.12. Review of the literature

To study the difficulties and challenges of academic writing in general, AlMarwani (2020) explored postgraduate TESOL (Teaching English to Speakers of Other Languages) and determined the necessary practices to overcome them. According to the needs of postgraduate TESOL students, the author used semi-structured focus group interviews to collect the data. The analysis of the found results revealed the main types and categories of the difficulties: language skills, academic writing skills, and source managing skills. Moreover, the author used Google classroom to motivate them to improve academic writing. The results revealed the growing understanding of digital tools' impact on encouraging independent learning and critical awareness that contribute to

the enhancement of academic writing. However, the students still think that feedback from lecturers and supervisors is a crucial source of support.

Sulaiman & Muhajir (2019) proposed a study in order to determine the students' difficulties in writing scientific papers at the English Language Education, Universitas Muslim Indonesia (UMI) and to find out the needs and learning objectives of the students. They used questionnaire for 44 students registered at the UMI, during the 2018/2019 academic year. The study is a descriptive quantitative design that aims to answer the following questions: 1) what are the difficulties faced by English Education major students in academic/scientific writing? 2) what are the common errors of English Education students in writing scientific papers? And 3) what teaching approach can facilitate success in scientific writing?

The results of this study show the difficulties faced by these students when writing scientific papers as follows: grammar (31%), scientific writing style/rules (24%), vocabulary, spelling and coherence (11%), writing arrangement (7%) and punctuation (5%). Moreover, they found out the frequent common errors that occur in writing scientific papers: spelling (29.2%), use of capital letters (17.75%), and punctuation (15.27%). In this paper, the authors investigated the necessary methods and approaches to enhance and to strengthen the level of students in their scientific writing so that the results are: Reviewing writing such as the level of words, sentences, paragraphs, and grammar, making outlines, applying three steps in the writing process such as planning, writing and revision and understanding the formal and informal styles as well as oral and written forms so as to be able to avoid words and phrases that were not needed.

Javad & al (2016) investigate the English for Research Publication Purposes (ERPP) needs of Iranian non-native speakers of English researchers. In this study, a questionnaire and semi-structured interview and a corpus of the referees' comments were used. The study was about

groups from three fields: engineering, science, and humanities. The finding was as follows: language-use problems accounted for 65%, 70% and 83% of all the comments of peer reviewers for engineering, humanities, and science manuscripts, respectively. Therefore, the analysis of these found results revealed that these researchers face problem with the use of language more than with the technical contents writing a scientific manuscript. In addition, the problems related to the coping with the syntactic and lexical use much more than discourse and rhetoric. However, science researchers believed in the primacy of lexis and syntax over discourse and rhetoric due to the existence of some definite moves in their papers, humanities researchers stressed the significance of knowing the moves of different sections of an article. Academic writing training, hence, should address such issues as balance in the use of active and passive voice, consistency in the use of tense, natural sequence of the parts of speech, lexical choice of scientific terminology, clarity, and brevity. Moreover, the study finds that deficient information, irrelevant reference, and content similarity are other problems faced by the novice researchers. The findings of this study show the universal problem of Iranian researchers such as: clear description of technical contents, using lexically and grammatically appropriate language, while benefiting from rhetorical and discourse features of effective writing.

The author of (Amrate, 2019) achieved a study in order to find out the academic writing difficulties facing the Algerian PhD students during their doctoral thesis in the United Kingdom (UK), for this purpose, the questionnaires were designed to gain as much as possible information about students' profiles and difficulties. Therefore, he used mixed-method approach for the aim of getting reliable and consistent data. The sample of his study is formed of 49 Algerian PhD students in the UK completing their doctorate thesis in English. The results of this study show the various difficulties faced by these PhD students despite the fact that the most of them were taught academic

writing in a university core module at least in their MA degree. The academic language, coherence and cohesion and critical writing are the most frequent difficulties that face the Algerian PhD candidates in the UK. Moreover, The PhD students revealed that they were not prepared enough for the academic writing in the doctoral degree.

2.13. Conclusion

We can say that academic writing is a well-organised process that aims to present the scientific writings in a proper way. It is considered a complex process and a challenge, especially for novice researchers, to write academically their scientific papers. In this regard, this chapter presented an overview about the basic concepts related to academic writing. In addition, it provided the different features of the academic writing and its types and mentioned the approaches of writing and academic text. Furthermore, stating a number of the challenges of learning and acquiring the academic writing needed skills by the learners. Moreover, this chapter explain the definition, rules, roles and characteristics of scientific writing. Finally, it listed the structure of a scientific research article and explains the concepts related to English for Research Publication Purposes (ERPP).

Chapter 3: Fieldwork and Data Analysis

3.1. Introduction

The aim of this study is to investigate the difficulties faced by novice researchers especially PhD students when writing and publishing their research articles, the case study is the doctoral students of computer science department in the university of Biskra. This chapter presents the practical part of the study. It deals with the analysis of PhD students' questionnaires that aim to investigating the problems of writing a scientific research article and the most frequent reasons for rejecting their publications in the journals and conferences. This chapter Which includes a detailed analysis and interpretation of the gathered data from the questionnaire followed by a thorough discussion of the findings in an attempt to answer the research questions and check the validity of the suggested research hypothesis.

3.2. Methodology

The qualitative method seems more important to serve the need of the research hypothesis and due to the limited amount of time. The description of PhD students' difficulties in writing their scientific research papers which is the main focus of our study. It is decided that the questionnaire would be the most appropriate instrument that can be useful in collecting, analysing the gathered data, saving time and efforts by gathering the needed information in a short time. This questionnaire can determine the facts about this investigation to find and explain the reasons of refusing the publication of the PhD students.

3.3. Research Design

The method of this research is the qualitative method. The students' questionnaires are more useful in helping to better understand students' needs and achieving more reliable and comprehensive information. The researchers chose the descriptive way to deal with the variables in this study. Questionnaires for students are used as research tools that are useful in collecting data. The analysis of student's questionnaire has shown the most frequent difficulties face by the PhD students when writing their research papers.

3.4. The Sample

The study sample who took part in the present study are Algerian scientific researchers and PhD students enrolled at MKU of Biskra, specializing in computer science. Therefore, the sample of the study consists of 53 PhD students in the department of computer science university of Biskra. The participants of this study are selected randomly, because it is regarded as the most reliable method in collecting data. However, with a small size, caution needs to be applied, as the findings might specific to this case only and may not be the case to all researchers.

3.5. Data Collection Procedure

The students' questionnaire was distributed to the PhD students of the department of computer science (LINFI laboratory and LESIA laboratory) who are required to answer individually by giving their opinions about the subject. Then, the answers were collected and analysed.

3.6. Administration of the Questionnaire

Data gathering tools are methods a researcher use to collect data and they are of great important to have effective results thus, therefore the researcher should carefully choose them taking into account his research theme. The questionnaire is one of the most important basics in

any research. The target population of this study is the doctoral students of computer science department at Mohamed Kheider University of Biskra. The number of the PhD students is 53 students. The choice of PhD students was based on the consideration that they have already experienced writing scientific research articles and they are considered as novice researchers. Several of them they submitted scientific research articles in a journal or a conference and they received the reviewers' comments about the content, the form and the language. Moreover, the doctoral students, generally, suffer from many difficulties because it is the first experience to write a scientific research article.

3.7. Description of The Questionnaire

The questionnaire is composed of four sections of 24 questions. It consists of close-ended questions, which contain YES/NO questions and multiple-choice questions and open-ended questions. The questionnaire's objective is to give the chance to PhD students of computer science to express their problems and difficulties of writing scientific research papers and the most frequent received comments from the reviewers.

The items are grouped in four sections as indicated below:

- Section One: Background Information
- Section two: Researchers' difficulties
- Section Three: Researchers' Proficiency in English Language;
- Section Four: Researchers Difficulties in Writing and publishing scientific paper

Section One: Background Information (Q1-Q4): It tries to obtain personal information about participants such as: gender, The PhD system (LMD or classical), the Department and the faculty that they belong to and the number of years of studying in PhD.

Section Two: Researchers' difficulties (Q5-Q10): this section contains six questions it is about describing the researcher difficulties in conducting research in general and the most frequent received remarks from reviewers. It aims at exploring the most faced problems and their degree of difficulty and the number of written research articles to have an idea about the experience of the researcher.

Section Three: Researchers' Proficiency in English Language (Q11-Q15): This section attempts to explore the level of the researcher in English language in general and more particularly in the skill of writing. In addition, it aims at knowing if the researchers are satisfied with the way they have been taught English or no.

Section Four: Researchers Difficulties in Writing and publishing scientific paper (Q16-Q24): This section is the core of our questionnaire; its objective is to investigate the main language difficulties of writing research articles and the kind of these difficulties. Moreover, it tries to know in which section they receive the most frequent remarks of reviewers so that we know the most difficult sections for them.

3.8. Results, analysis and interpretation

3.8.1. Section One: Background Information

Q1. Would you specify your gender please?

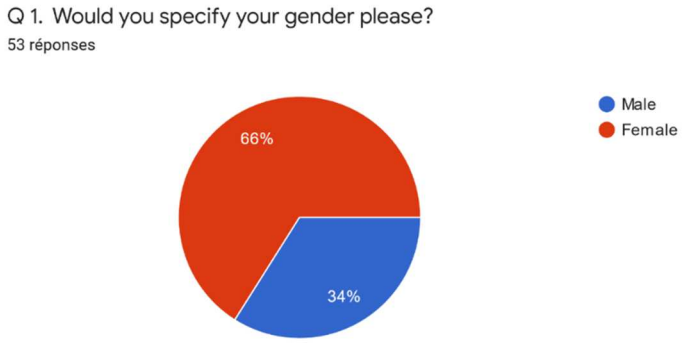

Figure 3.1: Participants gender distribution

As can be seen from the figure above, which represent the distribution of students' gender, the majority of the respondents from Computer science department are female. It is observable that females represent (66%) of the sample whereas males represent only (34%). The preview results means that in the doctorate contest, the females succeed more than males in the computer science department in University of Biskra.

Q2. You belong to Classical system or LMD system?

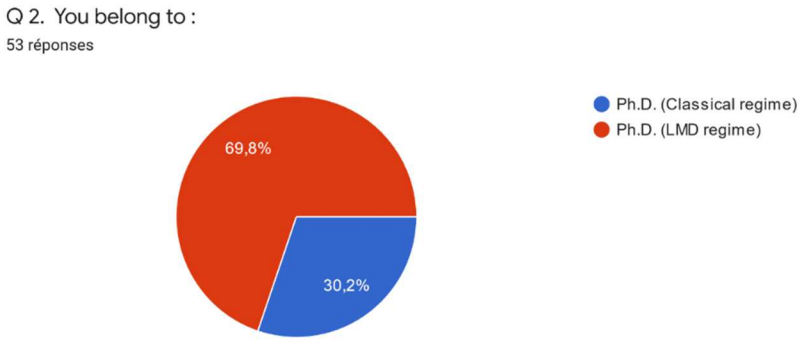

Figure 3.2: Participants PhD system distribution

Writing scientific research papers

The majority of the respondents belong to the LMD system (69,8%) whereas the percentage of respondents from classical system is only 30.2%. It is obvious because LMD system is the new one and the used system in Biskra university. The number of the PhD student who belong to classical regime is decreasing year by year because it is not used anymore.

Q3.1 The Department that you belong to

Q3.2 The faculty that you belong to

All the participants belong to the faculty of exact sciences and natural and life sciences. These participants are from the computer science department and belong to two laboratories "LINFI and LESIA".

Q4. How many years you are studying in PhD?

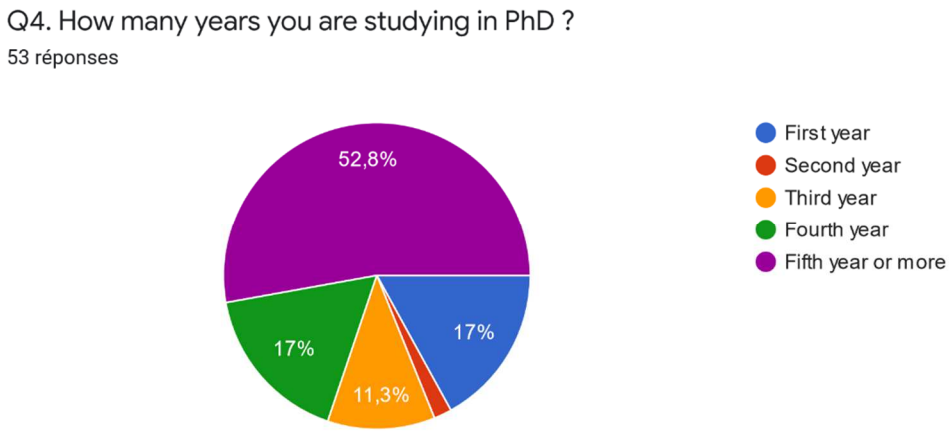

Figure 3.3: Number of years in PhD research

As indicated in the figure above, the majority of respondents have more than 3 years studying in PhD (69.8%) so that they are conducting research task during this period but they are considered as novice researchers.

3.8.2. Section two: Researchers' difficulties

Q5. According to you, to what extent writing scientific research is difficult task?

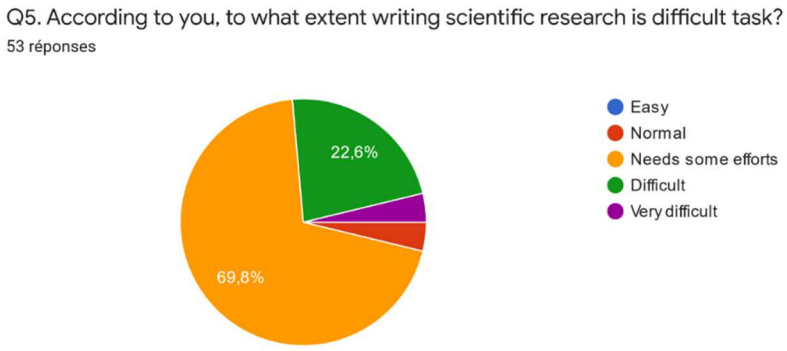

Figure 3.4: to what extent the difficulty of writing scientific research task

As noticed from the result above, the majority of the participates agree that the process of writing a scientific research article needs efforts and difficult task (92.4%). Therefore, these PhD students face many difficulties when writing their research papers in many aspects. According to the reports of participants in the questionnaire, scientific writing assignments in English is considered as a hard task for the PhD students. In the survey results, the PhD candidates shared the extent of scientific writing difficulty. This study investigates the degree and the types of this difficulties in using English language to write their research papers.

Some of the participants justified these difficulties by various reasons. Here some justifications:

- Providing a concise, precise and clear academic text is difficult task either for native or non-native students because it requires a set of techniques, gathered by learning and experience, to make a described content easy to follow and understandable in the fastest way.

Writing scientific research papers

- The author needs a certain level to be able to express his idea in a scientific way. paraphrasing when referencing other people works is also difficult
- Have a good language, how to choose the appropriate tense, sentences, grammar…etc
- Lack of experience and it requires some efforts in terms of technical skills and in terms of methodology. Despite of the technical quality of the contribution, materials and methods should be clear to the reader
- Because I am not familiar with writing reports and summarising the works of others
- It needs some efforts, because we have to follow a certain structure correspond with writing a scientific article.
- Writing scientific paper needs some skills and knowledge about terminology, vocabulary and exact use of them which is not a trivial task especially in analysing the results and comparing to other ones
- Before writing scientific research, you need to collect and see a certain number of other research, so, it takes time and effort.
- We are dealing with many ideas and a lot of details and besides that we don't know exactly how to present these ideas in a well-writing style.
- Generally, explaining complex idea require skills and a difficult process to maintain a certain level of simplicity and consistency of much simpler ideas.

Writing scientific research papers

Q6. Reorder these tasks of conducting scientific research according to their degree of difficulty? (Please use numbers (1,2,3,…etc) from the most difficult one to the less difficult)

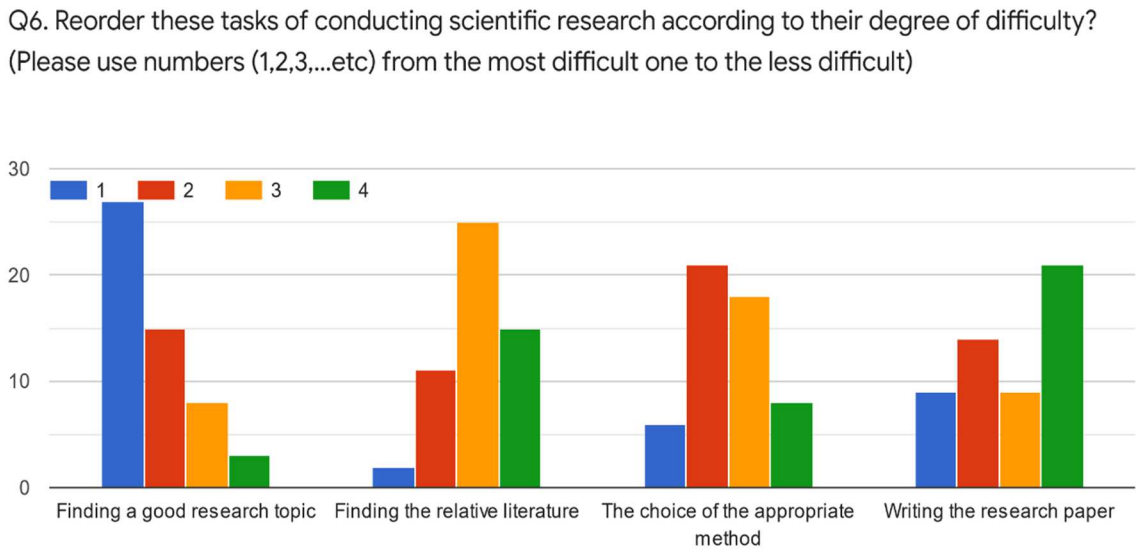

Figure 3.5: Th order of the difficulty of writing scientific research tasks

In this question the PhD candidates have been asked about the difficulty of the tasks related to the conducting the scientific research by ordering them. The majority of them answered that finding a good research topic is the most difficult task followed by writing the research article which is the aim of this study. The choice of the appropriate methods takes the third place then finding the relative literature comes in the fourth order. In scientific domain, the technical content seems to be the most important and difficult task followed directly by the process of writing a scientific paper that requires good level of language and important experience in writing, organising, structuring the research article.

Writing scientific research papers

Q7. To what extent linguistic and communicative competence is important in conducting a scientific paper?

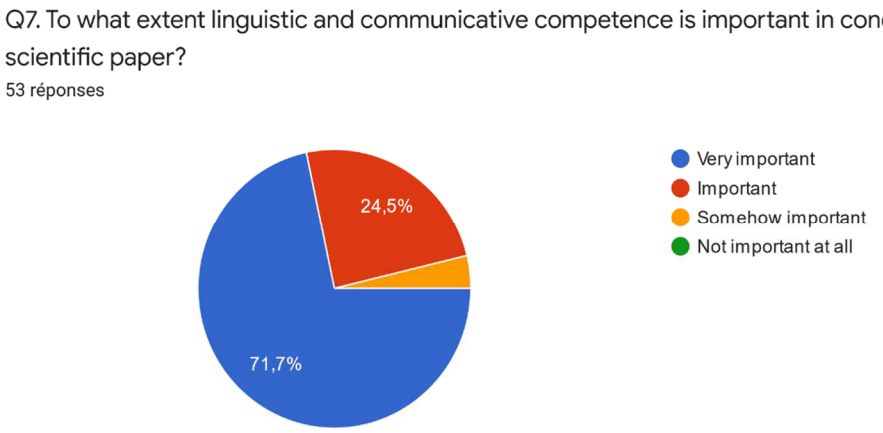

Figure 3.6: to what extent the importance of linguistic and communicative competence in conducting a scientific paper?

This question seeks to know the importance of linguistic and communicative competence in conducting scientific paper. 71,7% of the respondents consider it very important and 24.5% of them see this competence as important. It is very clear that mastering language is an essential competence to achieve scientific research. The respondents gave a set of reasons of the importance of linguistic competence:

- To conduct good research paper, we need a linguistic and communicative competence, for choosing the topic, the sentence and for presenting the results of the work
- Writing is an art that requires the tools of this art in order to master it and linguistic and communicative competence is ones of these tools.
- To make reviewer understand your topic and to communicate the paper with the others
- The use of incorrect words, structures and tenses might lead to confusing or misleading resulting in refusing or neglecting the paper

Writing scientific research papers

- To read and to understand an article you should have a good level in English, it will be boring to translate everything. Also, to describe your idea you have to choose the adequate words
- It is very important because it helps to improve the quality of the scientific paper.
- Publishing in good journal need a well written paper in terms of language
- It plays a great role in paper acceptance by reviewers
- The research science, for writing and reading and understanding theory of theses
- knowledge transfer requires a good linguistic and communicative both oral and written competence
- linguistic and communicative competence are the tools that convey your idea to the reader. Thus, bad linguistic and communicative competence equal badly explained ideas.
- The language is important to communicate and make people understand what you are writing in order to clarify the research problem and the contribution of our research, in addition to ensure the acceptance of the article in excellent class journals and conferences
- To write a scientific paper, you need to present your ideas very well and convince anyone who reads your article that your scientific contribution is important and has an impact which means that your paper is easy to read and understand, the language used is very simple and anyone who reads the paper can understand it from the first time and this needs a high level of linguistic competence.

Writing scientific research papers

Q8. How many research articles you have conducted?

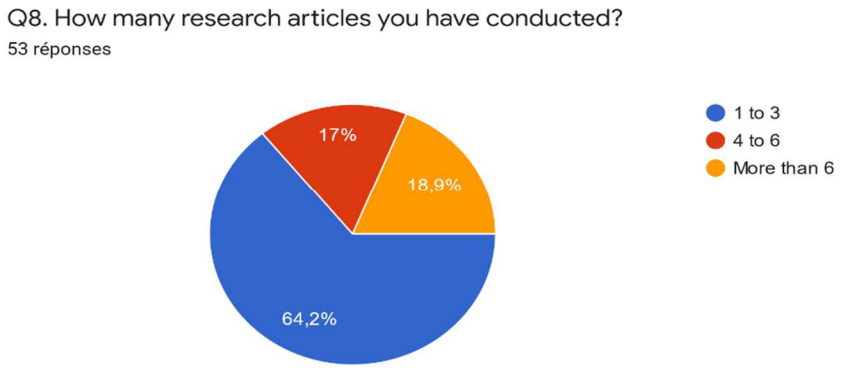

Figure 3.7: The number of achieved scientific research papers

The objective of this question is to know the experience of the participants in writing scientific research articles. Most of them (64.2%) have written from one to three articles, 17% have conducted from four to 6 research articles and 18.9% have achieved more than 6 research articles. Therefore, all the participants have an experience of writing scientific research articles but the majority of them are considered as novice researchers.

Q9. What are the frequent kinds of remarks of reviewers that you received? Please order them?

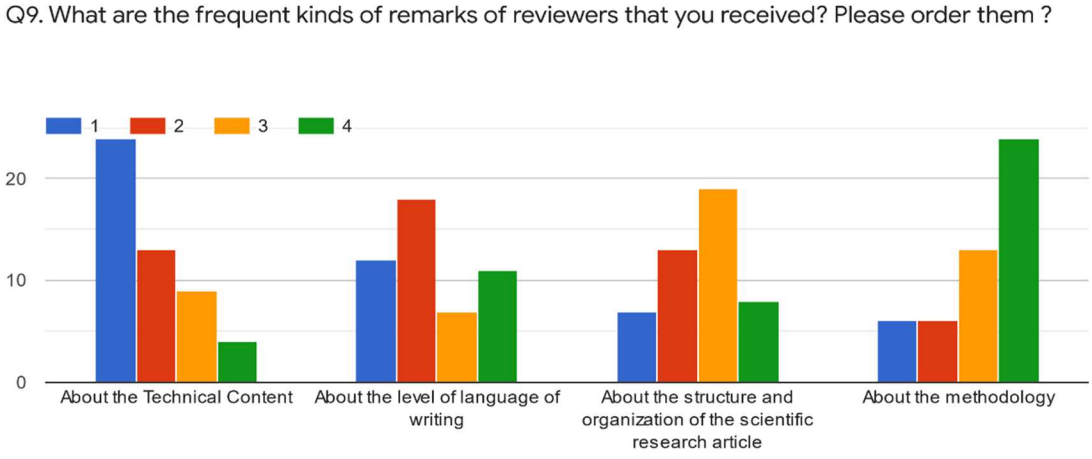

Figure 3.8: The frequent kinds of remarks of reviewers

Writing scientific research papers

Novice researchers, generally, receive several kinds of remarks from the reviewers, these remarks are the reasons of refusing the scientific papers to publish it. The Figure 3.8 shows the frequent kinds of remarks of reviewers when reviewing the research articles. The majority of remarks are related to the technical content of the research articles which is the most important point that shows the contribution of the researcher. In the second place comes the remarks about the level of language of writing, this shows the important role of good level of language to convey the message, make the article easy to understand and to convince the reviewers and to give more chance to the paper to be understood and accepted. Some of participants received some remarks about the structure and organisation of the scientific article but less than the remarks of the level of language. The remarks of methodology are the less received ones by the researchers.

Q10. What are the most frequent language errors and mistakes you have done in you writing of scientific research article?

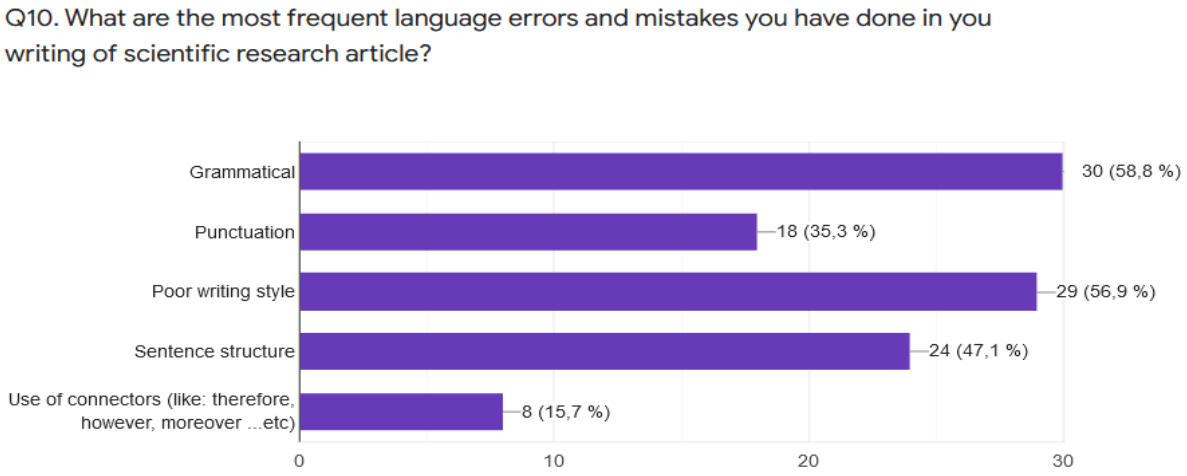

Figure 3.9: The most frequent made language errors and mistakes

The figure 3.9 demonstrates the most frequent made language errors and mistakes by novice researchers. The grammatical mistakes and the poor writing style are the most made mistakes in the writing of scientific research article by 58.8% and 56.6% respectively. 47.1% of the

participants confess that they make several sentence structure mistakes in their research articles. Moreover, 35.3% of the respondents said that usually they have problem with the punctuation. Finally, some of the candidates 15.7% misuse the connectors like therefore, however, …. etc. We can constate that the most of the respondents agree that they make several mistakes in various types: grammatical, style, punctuation …etc. These mistakes decrease the chance of acceptance their paper to be published.

3.8.3. Section Three: Researchers' Proficiency in English Language

Q11. In which of the following stages do you need English language the most?

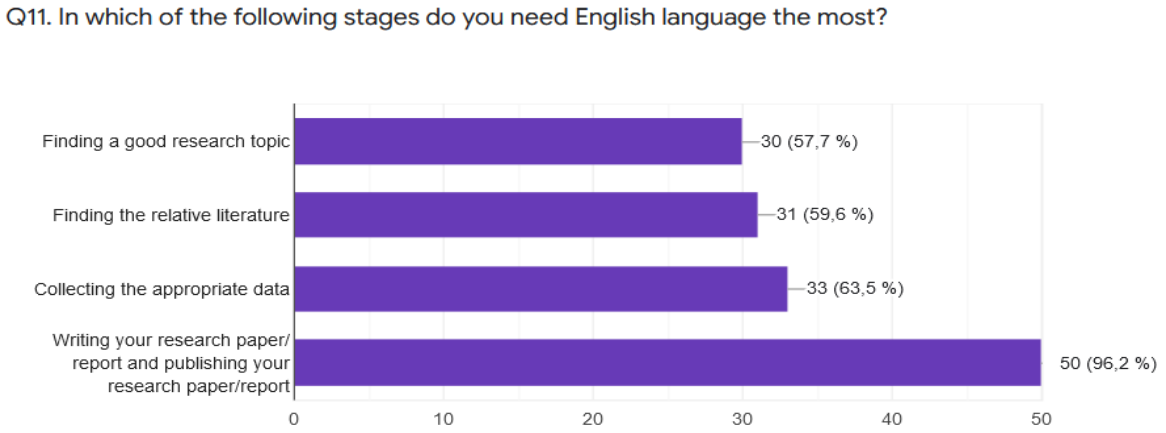

Figure 3.10: The stages that need the English language

Conducting scientific research article passes by set of stages, each stages has its characteristics and methodology. In order to investigate the degree of need and use of English language in each stage, we asked the participants the following question: In which of the following stages do you need English language the most? The results show the English language is really needed and important for the PhD students in the department of computer science in all stages of conducting a scientific research article. 96.2% of the respondents agree that they need the English language in the stage of writing the research article. Even in the stages of finding the topic and the relative literature and collecting necessary data, the participants said it is needed also (about 60%).

Writing scientific research papers

These students studied in French and they will teach in French but in the process of achieving their research article they use English in all stages due to the English is the international language of computer science. The most of conferences, journals, documents are in English.

Q12. Are you satisfied with the way you have been taught English?

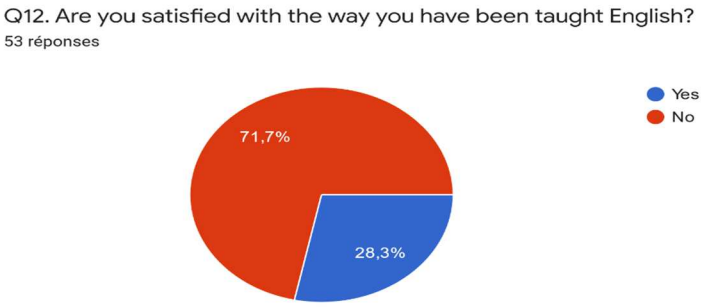

Figure 3.11: Percentage of satisfaction with the way of teaching English

All the participants have studied English language four many year (from primary school till the university) but they are still disable to write in English in good style and without mistakes. 71.7% of the respondents are not satisfied with the way of teaching English in all level (primary school, middle school, high school and university). They gave a set of reasons of their answer:

- In our country we use three different languages in education, it is very difficult to master one well
- We learn just vocabulary and grammatical lessons and don't learn how to speak in English or how to communicate
- curriculum is not up to date either sufficient and they taught us basics of English
- The English teachers gave us the language basics, but the student needs to make some efforts to develop his skills and they focus only on grammar
- We have been taught English in a very basic way. Therefore, kind of "continuous" self-learning efforts are needed to achieve the required level.

Writing scientific research papers

- We study only basics (computer parts, passive voice.... etc), it would be better if we were taught English at a high level such as (communication sessions, writing paper courses, paraphrasing style ...etc)
- There is a lack of writing correct essays and lack of practice of speaking
- I believe that learning a language will be easy at a young age. I didn't receive enough education in English as a child, so I followed a self-learning
- English for specific purposes is not well-taught subject in different English curriculum
- They focus in teaching letters and sound rather than meaning and communication.
- Problem of communication and discussion

Q13. Please describe your proficiency level in English put a tick?

Q14. Please describe your proficiency level in English in "Writing in general"?

Q15. Please describe your proficiency level in English in "Writing scientific articles in your field"?

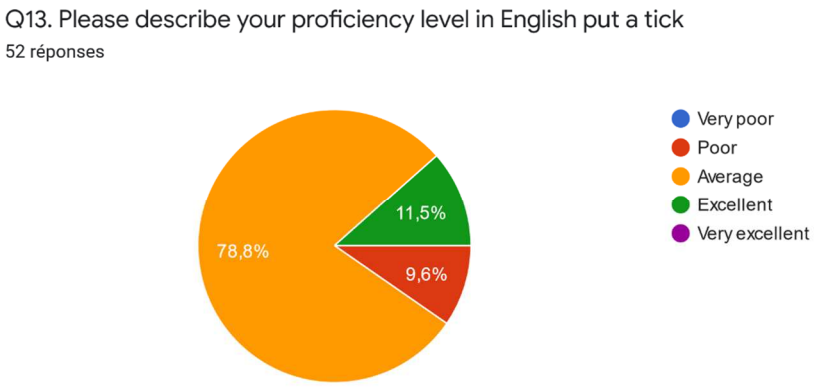

Figure 3.12: Proficiency level in "English language"

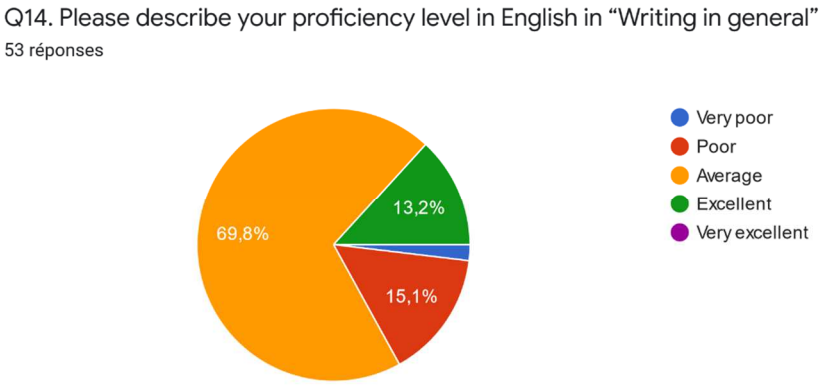

Figure 3.13: Proficiency level in "English Writing"

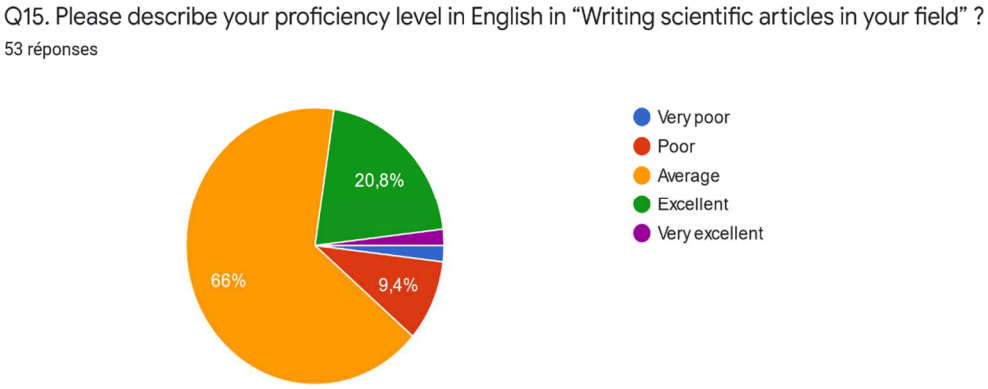

Figure 3.14: Proficiency level in "Writing scientific articles in your field"

The most of the participants think they have average level in "English language" (78.8%), in "writing in English" (69.8%) and in "writing scientific research article" (66%). Their level is not average because they don't know what is the average level. Many of them make basic mistakes (grammatical, vocabulary and sentence structure) in their answers of the questionnaire but they think they have average level. The majority of them have poor level.

Q16. Would you state what kinds of difficulties you face while writing English texts?

In this question, we tried to know the difficulties faced by the participants in their writing English text. The answers of the respondents show that they don't master the ways, methods and

styles of writing in English due to lack of practice and knowledge. Moreover, they suffer from poor vocabulary, choosing the appropriate words, spelling of the words, grammar and misuse of tenses. Another interesting problem is they confess that they translate directly from Arabic or French to English language word by word which gives very poor writing style. In addition, some respondents said they cannot write a good sentence structure and they keep the same structure as Arabic one. Others agree that they should respect the scientific writing rules while presenting our own proposal in an attractive way but they have not the enough knowledge and practice to do that. Many participants answered that they cannot explain their ideas and contributions (in research article) in attractive, clear and comprehensive way. Another difficult was presented by many participants: “Demystifying difficult ideas and express them in easily readable sentences”.

Q17. What are the acceptance requirements of these journals?

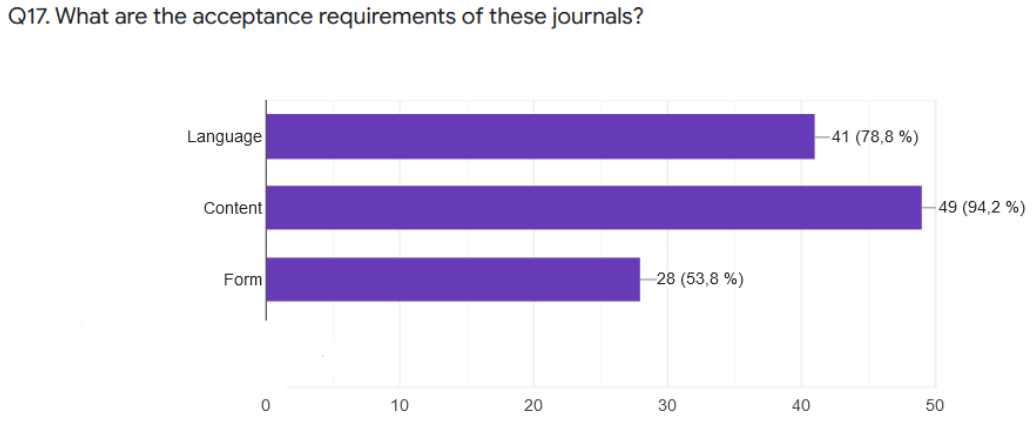

Figure 3.15: Research paper requirements of acceptance by reviewers

The acceptance and the publishing of research article needs several aspects to be fulfilled. This question is for highlighting the most important points for the acceptance of the research articles. 94.2 of the participants agree that the content is the most important in accepting the research articles by the reviewers in the domain of computer science. The scientific content and the contribution play the core role in publishing the research articles in the scientific domains.

Writing scientific research papers

However, 78.8% of the respondents (which is also a big percentage) said that the language is considered as a vital aspect in the acceptance of the research articles. Therefore, even if the content is well done, the language has a significant influence on the decision of the reviewers to refuse or accept. It is obvious that the good level of language helps to write the content, ideas, contribution, results …etc in a concise, precise, clear, correct, understandable way. Moreover, the form and the organization of the paper has an impact on the final decision of the reviewers which is the opinion of 53.8% of the respondents.

Q18. When writing in English for publication, do you

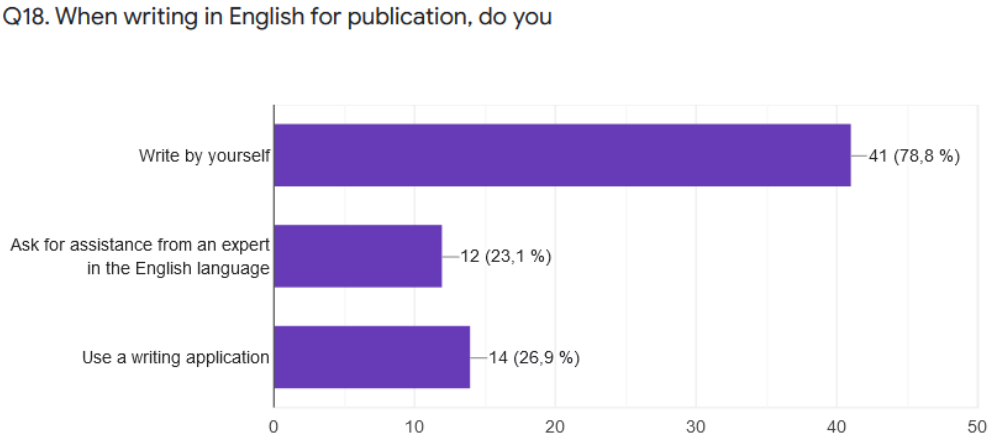

Figure 3.16: Researchers' facilities to write in English for publication purposes

This question attempts to know if the students ask for help while writing their scientific research articles. From the results, 78.8 of the respondents write their scientific research article by themselves but some of them declare that they ask for assistance from an expert of English language (23.1%) or use applications to help them in the writing process (26.9%). In this regard, this is either because the majority of them are novice researchers so that they think writing is an easy task (language proficiency). As the results show, some participants usually ask for help during writing. This result could be related to Q5 in which these participants find that writing in English language is difficult. Therefore, they asking for help when writing academically.

Writing scientific research papers

Q19. What are the language difficulties you find when writing a scientific research article?

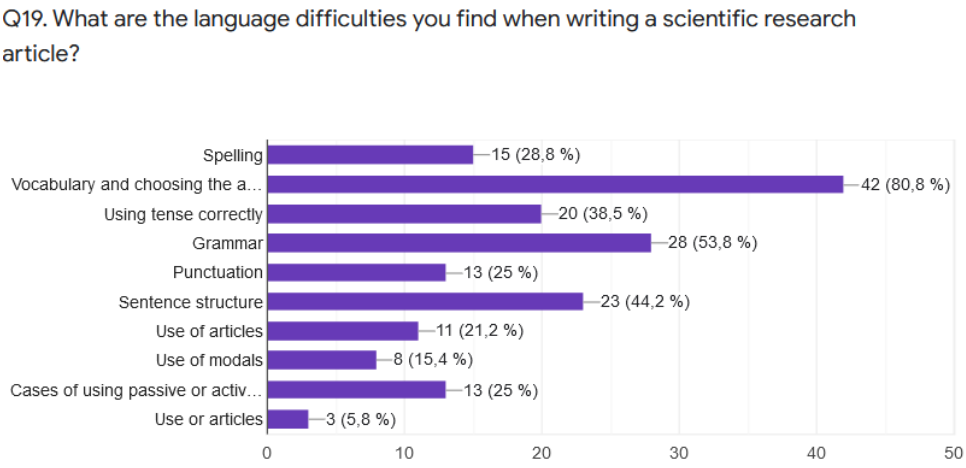

Figure 3.17: The language difficulties for novice researchers

Several difficulties are faced by the novice researchers in the process of writing a scientific research article. This question aims to know the English language difficulties for novice researchers. Out of 53, 42 participants (80.6 %) reported that they have serious difficulties in "vocabulary and choosing the appropriate words". 53.8% which represents 28 participants said that they have difficulties in term of grammar. Sentence structure and using tenses correctly are considered as difficulties for 44.2% and 38.5% of the participants respectively. a minority reported that they have other difficulties such as: Spelling (28.8%), punctuation (25%), cases of using passive and active voice (25%), use of articles (21.2%), use of modals (15.4%). As observed, the PhD students suffer from many language problems when writing their scientific research articles but grammar, vocabulary, sentence structure and writing style are the most difficult aspects of language for them.

Writing scientific research papers

Q20. In which section you receive the most frequent remarks of reviewers?

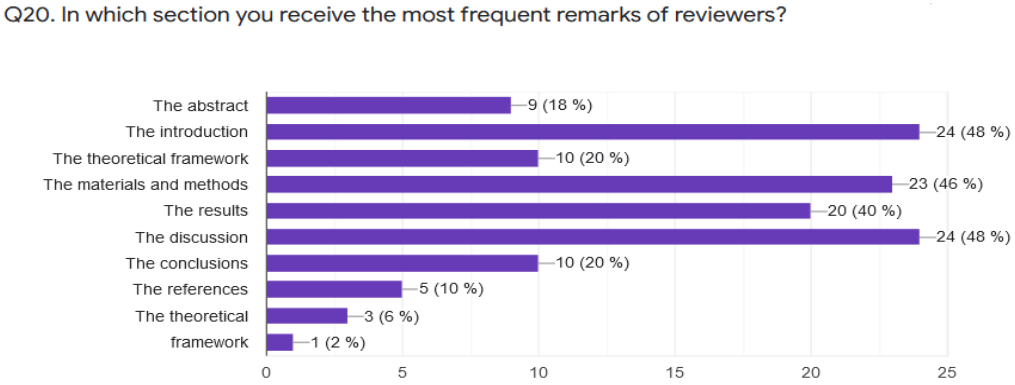

Figure 3.18: The sections that receive the most remarks

From the results in the Figure above, the highest percentage of the respondents (48%) agreed that the introduction and the discussion receive the remarks of the reviewers. Moreover, high percentage of the participants (46% and 40%) reported that they receive many remarks in the sections: Materials and methods and the results respectively. Some of them (28%, 20%, 18%, 5%) received remarks in the following sections: the theorical framework, the conclusion, the abstract, and the references). The introduction and the discussion of the results is considered the most difficult sections that need high level of language, reach vocabulary and good style.

Q21. What are the most important reasons of rejecting the publication of a scientific research article by journals or conferences?

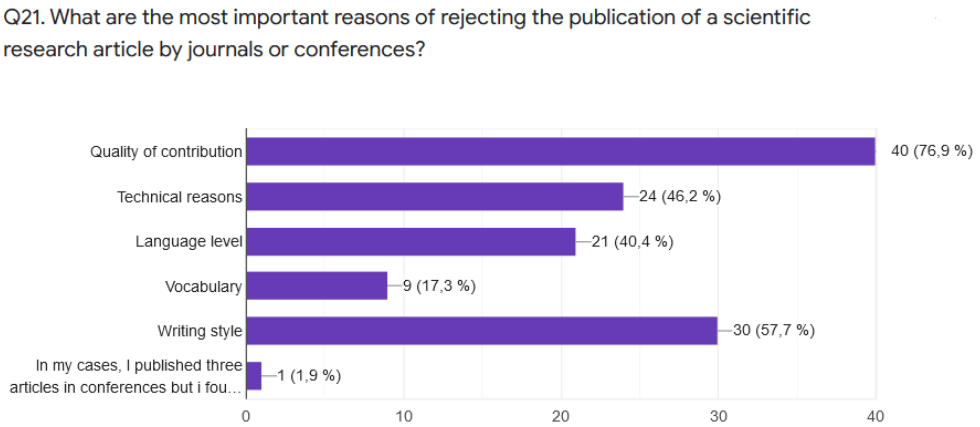

Figure 3.19: The reasons of rejecting the publication of research articles.

Writing scientific research papers

According to the majority of PhD students (76.9%), The first and important reason that forbidden them to publish their scientific research articles is the quality of contribution. In the scientific fields, generally, they focus on the contribution more than other aspects. However, a high number (30) of the participant which represents 57.7% of them agreed that the writing style plays significant role in rejecting their research articles by the reviewers. Moreover, 40% of them said the problem of language level in general is the reason of receiving the rejection. Finally, the results illustrate that the technical reasons represent 46.2%.

Q22. Did you read courses, books …etc about how to write a scientific research articles?

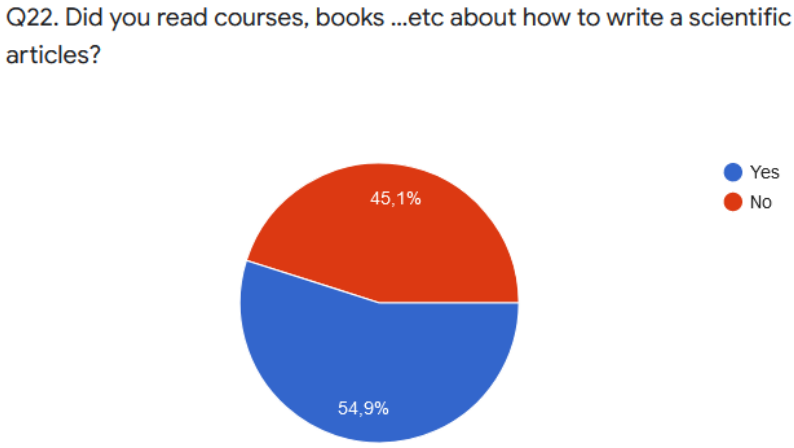

Figure 3.20: Experience of the researchers in scientific writing.

In this question, respondents are asked to identify if they studied or read any documents about how to write scientific research articles. As the figure shows, (54.9%) of them said yes, whereas (45.1%) said never. When we asked them about the number of documents that you read about writing scientific research articles the majority of them reported that they read less than 3 documents which is really not enough to master the writing process. In addition, they did not practice the process of scientific writing.

Writing scientific research papers

Q23. In your opinion, what are the solutions to overcome these difficulties faced by novice researchers when writing their scientific research articles?

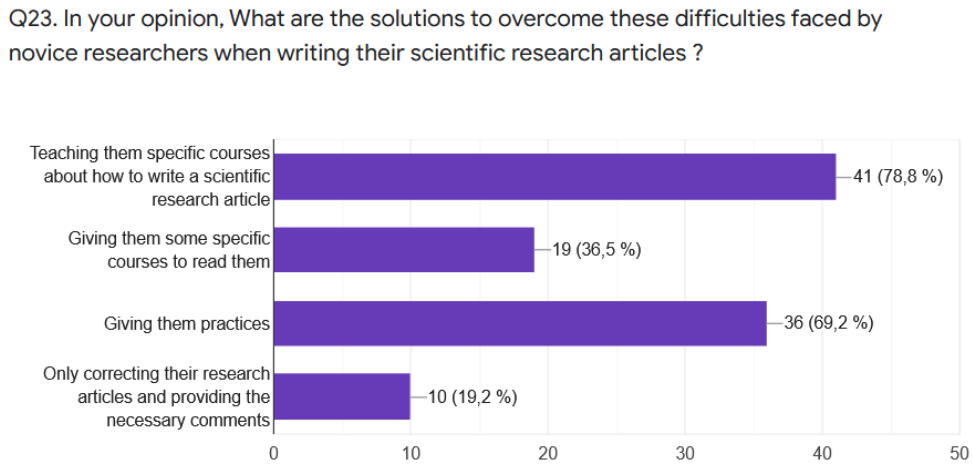

Figure 3.21: Solution to overcome the scientific writing difficulties.

In this question, we aim to know the proposed solutions for novice researchers to face the difficulties of writing scientific research articles. The majority of the participants demanded strongly to give them specific courses and practices about scientific writing. For them, they have a big lack of practice and specific courses about writing scientific articles.

Q24. If you have any suggestions or comments, please feel free

The suggestions of the respondents are as follows:

- We need courses "How to read, choose, write article and read courses about English
- Proof reading and giving necessary comments and grammar
- Practice and practice and practice
- I suggest that post-graduate students attend workshops "seminars", on "How to write scientific papers: theoretical and practice". Enhance the content of English modules in different curriculum
- Give courses of writing scientific research article push them to write in English

Writing scientific research papers

- I suggest for English teachers to prepare online courses in MOODLE (interactive with quiz)
- I would highlight the fact that reading as many relevant research papers as we can, would bring a magical effect on improving the PhD student's scientific writing skills. Thank you for your valuable efforts.
- Create a writing centre where experienced researchers can help novice ones to produce better papers.

3.9. Discussion of the Findings

The present study investigated the language difficulties that PhD students in the department of computer science face in writing their publications in English. The analysis of the different questions in this questionnaire provides us with valuable information that has given us the opportunity to answer some of the vital research questions that were intended to be investigated. Regarding researchers' questionnaire, it can be deduced that most of them have learnt English in the middle and high school, and in the university but they cannot write in English and they find several difficulties when writing their scientific research articles.

First of all, in the university, department of computer science, the study and the instructions are in French. Academic publications are required at the level of PhD preparation.

In the field of computer science, writing of scientific research articles in English is favoured and most of the time it is an obligation. Moreover, journals and reviewers require a correct Academic English with mostly of terminology in the field of interest, hence, a high level of English proficiency expected from scholars. In this study, respondents revealed that they are not satisfied with learning English at primary, secondary and high school and even in the university. They received only the basics of English each year and they repeat the same basic courses of grammar.

Writing scientific research papers

And this resulted many difficulties faced by the PhD students when writing their scientific research articles. In addition, these students are novice researchers most of them they have not important experience with writing in English especially writing research articles. The most of them revealed that that face serious difficulties in writing their research articles and the poor level of writing cause the rejection of their articles even if the contribution is accepted.

The participants think that the whole process of conducting a research article is difficult in and the writing of the final paper as well and they revealed that mastering language is an essential competence to achieve scientific research. From the Q9, we concluded that the majority of frequent kinds of remarks of reviewers when reviewing the research articles are related to the technical content of the research articles which is the most important point that shows the contribution of the researcher. In the second place comes the remarks about the level of language of writing, this shows the important role of good level of language to convey the message, make the article easy to understand and to convince the reviewers and to give more chance to the paper to be understood and accepted. Due to poor level of English of PhD students, they make several kinds of mistakes in their research articles. The grammatical mistakes and the poor writing style are the most made mistakes in the writing of scientific research article followed by sentence structure mistakes. Moreover, some of the respondents said that usually they have problem with the punctuation and misuse the connectors like therefore, however, …. etc. Researchers are supposed to write their research articles and to publish their findings in English; however, they feel they have average level in English because they think of General use of English, but once starting to draft a publication, they start seeing their weaknesses. This means that PhD students who belong to Computer Sciences do not really conceive their real deficiency in English.

Writing scientific research papers

The participants don't master the ways, methods and styles of writing in English due to lack of practice and knowledge. Moreover, they suffer from poor vocabulary, choosing the appropriate words, spelling of the words, grammar and misuse of tenses. Another interesting problem resides in translating directly word by word from Arabic or French to English language which results very poor writing style. Moreover, they cannot write a good sentence structure and they keep the same structure as Arabic one. The PhD students cannot respect the scientific writing rules while presenting their research articles in an attractive way because they have not the enough knowledge and practice to do that. Many participants said that they cannot explain their ideas and contributions in attractive, clear and comprehensive way. Another difficult was presented by many participants: "Demystifying difficult ideas and express them in easily readable sentences". Therefore, they ask for help from expert of English to help them and use applications that facilitate the writing of their scientific article.

In addition, they need during their research process to translation process from French to English which entails a law level of English proficiency, and even when reading the references in English they face the problem of being unable to understand them. For this, several researchers are convinced that English proficiency is very important. Another thing, the majority believe that writing in English is hard task because they have studied General English without satisfaction with the way they have been taught English. These results are an indication on the facts that English constitutes hard challenges for novice researchers and even experienced scholars in many aspects.

The article contains set of section, each section has its degree of difficulties. The PhD students find the important difficulties in the writing of the introduction and the discussion so that these sections receive the most remarks of the reviewers followed by the Materials and methods

and the results. Some of remarks of the reviewers concern the sections: the theorical framework, the conclusion, the abstract, and the references.

45.1% of the participants didn't read any documents about how to write a scientific research article hem said yes, whereas the rest of them read less than 3 documents which is really not enough to master the writing process. In addition, they did not practice the process of scientific writing. The majority of the participants demanded strongly to give them specific courses and practices about scientific writing. For them, they have a big lack of practice and specific courses about writing scientific articles.

3.10. Conclusion

To conclude, this chapter discussed the fieldwork of the present study that aims at investigating the difficulties of writing scientific research articles for novice researchers (PhD students). These results are an indication on the facts that they face many difficulties and the requirements of the publication of their works according to the technical content (contribution) and the level of writing of the research article so that writing in English constitutes hard challenges for them and for experienced scholars in many aspects. Yet, they argue that language proficiency is important in publications; nevertheless, for some journals, the academic language is more important because it is the formal form of their findings to be effective to the target audience. Likewise, they have many difficulties in reading, in translation and in drafting a high level in writing in English language. In short, researchers have a problem in meeting journals' requirements concerning language level due to: the study of basics of grammar during their formation, the absence of specialized English (English for publication purposes) at university level, lack of seminars and workshops for post-graduate students on "How to write scientific papers: theoretical and practice", The repeated content of English modules in different curriculum,

Writing scientific research papers

lack of courses and practice about writing scientific research article and English for specific purposes is not well-taught subject in different non-English curriculum.

General Conclusion

Writing is considered a crucial skill, for it is one of the aspects of language literacy. Therefore, it sustains the way of expressing our ideas and writing our scientific works and findings to communicate them with other scientists. The PhD students have to write their scientific research article and they are obliged to follow very defined structure and use acceptable level of language in order to make their research articles academic, understandable and clear. The PhD students in the Computer Science department, at university of Biskra seemed unable to write their scientific research papers in the appropriate and inadequate style and high level of language. Moreover, the requirements of the publisher journals, especially good ones, are providing good technical content and high level of writing style without mistakes.

The ultimate aim of the current research is to attempt to answer the research questions and to confirm the research hypothesis which states that novice researchers lack the language proficiency to write their scientific research articles and they face many kinds of difficulties in the process of conducting scientific research. This study was conducted to make the Algerian academic community aware of the academic writing difficulties that face the PhD candidates in scientific field. The main focus of this research was given to scientific academic writing and its' difficulties, in order to enhance the academic writings within the Algerian academic community. Furthermore, we tried to show the impact of the previous education background on the level of

writing scientific research article. Additionally, this research highlighted the reasons behind facing academic writing difficulties for the PhD students. This investigation was carried out at Computer science department at Mohammed Khider University of Biskra. Concerning the population, the participants were chosen from The Two laboratories (LINFI and LESIA) of the department of computer science. 53 PhD students were given a questionnaire designed in order to get insight about the difficulties that the PhD students face the most during writing their scientific research articles.

According to the findings that obtained from the analysis of the questionnaires. The PhD students face different kind of difficulties in term of language when writing their scientific research articles. The results reported that they have serious difficulties in "vocabulary and choosing the appropriate words" and real difficulties in term of grammar. Sentence structure and using tenses correctly are considered as other difficulties in writing their research papers. Moreover, some of the PhD students suffer from other difficulties such as: Spelling, punctuation, cases of using passive and active voice, use of articles and use of modals.

In addition, The PhD students find serious difficulties when writing the introduction and discussion of the scientific research paper more than other sections. However, minority of them face problems in the following sections: Materials and methods, the theorical framework, the conclusion, the abstract, and the references. The introduction and the discussion of the results is considered the most difficult sections that need high level of language, rich vocabulary and good writing style.

Likewise, The PhD students argue that language proficiency is important in publications and Scientific journals realize hard requirements mainly the academic language. Also, they have many difficulties in reading, in translation and in drafting a high level in writing in English

language. In short, researchers have a problem in meeting journals' requirements concerning language level due to: the study of basics of grammar during their formation, the absence of specialized English (English for publication purposes) at university level, lack of seminars and workshops for post-graduate students on "How to write scientific papers: theoretical and practice", The repeated content of English modules in different curriculum, lack of courses and practice about writing scientific research article and English for specific

Recommendations

Depending on the study findings, the following suggestions and recommendations are addressed to students, teachers, and administrators:

- Post-graduate students attend workshops "seminars", on "How to write scientific papers: theoretical and practice" and Administrators should enhance the content of English modules in different curriculum to support the needs of these students.
- The majority of PhD students were not satisfied with the way of teaching English language (only basic grammar and without practice) is being taught, according to them there is a huge gap between theories and practice. Therefore, it is preferable to focus more on practice and enhance the syllabus of the English module by ESP courses about scientific and academic writing.
- The findings of the current study may help the syllabus developers to improve it and give more time for academic and scientific writing.
- The findings of the current study may help the teachers to focus on the difficulties highlighted in this study.
- Concentrate on the corpus approach and genre approach for writing scientific research articles.

Writing scientific research papers

- The students should read several relevant research papers as they can, so that would bring a significant effect on improving the PhD student's scientific writing skills.
- Give courses to the PhD students about how to read, choose, write article and read courses about English.
- Give courses of writing scientific research article and encourage them to practice and practice a lot in all stages and level.
- Make proof reading from experts and giving necessary comments and advice to the PhD students
- Give English for specific purposes (for publication purposes) to the students and enhance the curriculums of the English modules.
- English teachers prepare online courses in online platforms with interactive practices.
- Create a writing centre where experienced researchers can help novice ones to produce better papers.
- Because of PhD students in the department of computer science are unfamiliarity with research process it is recommended that in each module, a research paper would be assigned to them during the pre-graduate years.
- Students in Computer Science department learn just vocabulary and grammatical lessons and don't learn how to speak in English or how to communicate. Thus, the syllabus should be adapted to these requirements.
- it would be better if these students were taught English at a high level such as (communication sessions, writing paper courses, paraphrasing style ...etc)
- English for specific purposes is not well-taught subject in different English curriculum so that the curriculum should be improved to fit the needs of the PhD students.

Writing scientific research papers

- To write a scientific paper, you need to present your ideas very well and convince anyone who reads your article that your scientific contribution is important and has an impact which means that your paper is easy to read and understand, the language used is very simple and anyone who reads the paper can understand it from the first time and this needs a high level of linguistic competence. Therefore, students, teachers, and administrators should concentrate on these aspects to improve the level of the PhD students in writing their scientific research articles.

Limitation of the study

The present study aimed to investigate the difficulties face by novice researchers during writing their scientific research articles. The findings revealed that the PhD students face several difficulties in term of English language. Even though the study achieved its intended aim, it; however, represented some pedagogical issues.

The major limitation of this study was in the number of researchers because total respondents are 53 PhD students. We intended to make interviews with a number of teachers who supervise PhD students in order to get more precise data and information but because of the limitation of time it was not done. In addition, the few who have answered the questionnaire lack experience so that their feedback was not sufficient as it was expected. Yet, we could not get in touch with some researchers while many of them refuse to answer to the delivered questionnaire.

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Appendices

Appendix 1: Students' Questionnaire

Questionnaire

Dear Doctoral Student/Researcher,

This questionnaire serves as a data collection tool to determine the difficulties faced by novice researchers when writing their scientific research article. Your contribution will greatly help us to prepare our Master dissertation entitled "English for specific purposes: writing scientific research papers. Case study: PhD students in the computer science department" and achieve the research work objectives. You are kindly requested to answer the following questions either by ticking or providing your own information whenever necessary. Be sure that your responses will be anonymous and will be used for research purposes only.

Thank you for your time, effort and collaboration.

Section A: Background Information:

Q 1. Would you specify your gender please?

☐ Male

☐ Female

Q 2. You belong to:

☐ Ph.D. (Classical regime)

☐ Ph.D. (LMD regime)

Other (Please specify):……..……..

Q3. The Department and the faculty that you belong to

Department:……..

Faculty:…….

Q4. How many years you are studying in PhD?

☐ First year

☐ Second year

☐ Third year

☐ Fourth year

☐ Fifth year or more

Section Two: Researchers'

Q5. According to you, to what extent writing scientific research is difficult task?

- ☐ Easy
- ☐ Normal
- ☐ Needs some efforts
- ☐ Difficult
- ☐ Very difficult

Justify your answer please:

……

……

……

Q6. Reorder these tasks of conducting scientific research according to their degree of difficulty? (Please use numbers (1,2,3,…etc) from the most difficult one to the less difficult)

- ☐ Finding a good research topic
- ☐ Finding the relative literature
- ☐ The choice of the appropriate method
- ☐ Writing the research paper

Q7. To what extent linguistic and communicative competence is important in conducting a scientific paper?

- ☐ Very important
- ☐ Important
- ☐ Somehow important
- ☐ Not important at all

Justify your answer please

……

……

Q8. How many research articles you have conducted?

- ☐ 1 to 3
- ☐ 4 to 6
- ☐ More than 6

Q9. What are the frequent kinds of remarks of reviewers that you received? Please order them?

- ☐ About the Technical Content
- ☐ About the level of language of writing
- ☐ About the structure and organization of the scientific research article
- ☐ About the methodology

Q10. What are the most frequent language errors and mistakes you have done in you writing of scientific research article?

- ☐ Grammatical
- ☐ Punctuation
- ☐ Poor writing style
- ☐ Sentence structure
- ☐ Use of connectors (like: therefore, however, moreover ...etc)

If there are others, please specify them:

……

……

Section Three: Researchers' Proficiency in English Language

Q11. In which of the following stages do you need English language the most?

- ☐ Finding a good research topic
- ☐ Finding the relative literature
- ☐ Collecting the appropriate data
- ☐ Writing your research paper/report and publishing your research paper/report
- ☐ All of them

Q12. Are you satisfied with the way you have been taught English?

- ☐ Yes
- ☐ No

Justify your answer please

……

……

Q13. Please describe your proficiency level in English put a tick

- ☐ Very poor
- ☐ Poor
- ☐ Average
- ☐ Excellent
- ☐ Very excellent

Q14. Please describe your proficiency level in English in "Writing in general" ?

- ☐ Very poor
- ☐ Poor
- ☐ Average
- ☐ Excellent
- ☐ Very excellent

Q15. Please describe your proficiency level in English in "Writing scientific articles in your field"?

- ☐ Very poor
- ☐ Poor
- ☐ Average
- ☐ Excellent
- ☐ Very excellent

Section Four: Researchers' Difficulties in Writing and Publishing Scientific Papers

Q16. Would you state what kinds of difficulties you face while writing English texts?

……

……

……

Q18. What are the acceptance requirements of these journals?

- ☐ Language
- ☐ Content
- ☐ Form

Other (please specify) : ……...

……

Q19. When writing in English for publication, do you

- ☐ Write by yourself
- ☐ Ask for assistance from an expert in the English language
- ☐ Use a writing application

Q20. What are the language difficulties you find when writing a scientific research article?

- ☐ Spelling
- ☐ Vocabulary and choosing the appropriate words
- ☐ Using tense correctly
- ☐ Grammar
- ☐ Punctuation
- ☐ Sentence structure
- ☐ Use or articles
- ☐ Use of modals
- ☐ Cases of using passive or active voice

Others :

……

……

Q21. In which section you receive the most frequent remarks of reviewers?

- ☐ The abstract
- ☐ The introduction
- ☐ The theoretical framework
- ☐ The materials and methods
- ☐ The results
- ☐ The discussion
- ☐ The conclusions
- ☐ The references

Q22. What are the most important reasons of rejecting the publication of a scientific research article by journals or conferences?

- ☐ Quality of contribution
- ☐ Technical reasons
- ☐ Language level
- ☐ Vocabulary
- ☐ Writing style

Others:……

……

Q23. Did you read courses, books …etc about how to write a scientific research articles?

- ☐ Yes
- ☐ No

If yes how many: .....…….

Q24. In your opinion, What are the solutions to overcome these difficulties faced by novice researchers when writing their scientific research articles ?

- ☐ Teaching them specific courses about how to write a scientific research article
- ☐ Giving them some specific courses to read them
- ☐ Giving them practices
- ☐ Only correcting their research articles and providing the necessary comments

Others:……

……

If you have any suggestions or comments, please feel free

……

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Résumé :

La présente étude a investigué les difficultés rencontrées par les doctorants lors de la rédaction de leurs articles de recherche scientifique. Par conséquent, les questionnaires ont été conçus pour recueillir autant d'informations que possible sur les profils et les difficultés des doctorants. Les données requises pour l'étude ont été recueillies via un questionnaire en ligne (Google Forms) et un formulaire papier. L'échantillon de l'étude était principalement composé d'étudiants en doctorat du département d'informatique de l'Université de Biskra pour répondre à des questionnaires sur les difficultés auxquelles ils sont confrontés. Les résultats de cette étude ont montré qu'ils font face à divers défis et difficultés dans la rédaction de leurs articles de recherche scientifique. Les données obtenues ont révélé que les difficultés auxquelles sont confrontés les candidats sont représentées principalement, outre le contenu technique, le faible niveau d'anglais notamment : Grammaire, Vocabulaire, styles d'écriture, conjugaison ….etc. De plus, les participants ont exprimé qu'ils n'étaient pas suffisamment préparés pour la rédaction scientifique en général et la rédaction d'articles de recherche également. Sur la base de ces résultats, plusieurs suggestions et recommandations ont été proposées pour surmonter ces difficultés.

Mots-clés : Rédaction scientifique, Rédaction académique, Article de recherche scientifique, Difficultés de rédaction scientifique. ESP.

الملخص:

تناولت الدراسة الحالية الصعوبات التي يوا ههها طلاب الدكتوراه عند كتابة مقالاتهم البحثية العلمية. لذلك، تم تصميم الاستبيانات للحصو على أكبر قدر ممكن من المعلومات حو تعريف الطلاب والصعوبات التي يوا ههونها. تم مع البيانات المطلوبة للدراسة من خلا استبيان إلكتروني (Google Forms) ونسخة ورقية من الاستبيان. تكونت عينة الدراسة بشكل أساسي من طلبة الدكتوراه من قسم الاعلام الآلي بجامعة بسكرة للإ ابة على استبيانات حو الصعوبات التي يوا ههونها. أظهرت نتائج هذه الدراسة أن طلبة الدكتوراه يوا ههون تحديات وصعوبات مختلفة في كتابة مقالاتهم البحثية العلمية. وأظهرت البيانات التي تم الحصو عليها أن الصعوبات التي توا ه المرشحين تتمثل بشكل رئيسي، بالإضافة إلى المحتوى العلمي، في ضعف مستوى اللغة الإنجليزية خاصة: القواعد، والمفردات، وأساليب الكتابة، وتصريف الأفعا حسب المقام المطلوب ... إلخ. كما أنهم يتلقون معظم ملاحظات المرا عين على أقسام: المقدمة ومناقشة النتائج. علاوة علىلك، أعرب المشاركون عن عدم استعدادهم الكافي للكتابة العلمية بشكل عام وكتابة المقا البحثي أيضًا. وعلى أساس هذه النتائج تم اقتراح العديد من المقترحات والتوصيات للتغلب على هذه الصعوبات.

الكلمات المفتاحية: الكتابة العلمية، الكتابة الأكاديمية، مقا البحث العلمي، صعوبات الكتابة العلمية، اللغة الإنجليزية لأغراض معينة.