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Difficulties Encountered in the Translation of Medical Texts: The Case of First Year Master Students of English at the University of Frères Mentouri Constantine

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DEDICATIONS

This thesis is dedicated to:

To my sweet and loving husband, Yacine whose affection, love and encouragement

helped me to do this work in innumerable ways

To my sweet and lovely daughter Camélia

To my father and mother, Mouloud and Samia for their help and support during the

writing process of this thesis

To my brother and sister, Noureddine and Sihem

To my family

To my friends

To all my teachers

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ABSTRACT

This study tackles the problems of translating medical texts from English into Arabic. It uses an evaluative approach to investigate and discuss the problems and intricacies of translating medical texts from English to Arabic. The purpose of the study is to show the difficulties of translating medical terms and how they are tackled by first year master students of English. It also attempts to identify the importance of reading comprehension in achieving a good translation of medical texts. Accordingly, it is hypothesized that if students manage to use reading comprehension strategies to generate inferences that can help them understand medical texts; their translation will be more efficient. To give consistency to the evaluative phase, two questionnaires have been used, a questionnaire for fifteen teachers and a questionnaire for fifty students. The teachers' questionnaire aims to collect information on the Teachers' perceptions of the strategies adopted in the translation of medical texts. The students' questionnaire aims to collect information on the students' knowledge concerning the features of medical texts and the strategies allocated to their translation. A pre- post experimental design has also been used. The aim of the pre-test is to depict the students' translation and elicit the terminological difficulties encountered in the translation of medical texts. It also attempts to evaluate the strategies used by students in the translations of medical texts. The post-test aims to evaluate students' use of reading comprehension strategies to achieve a good translation of medical texts. The result of the analysis revealed that students' use of reading comprehension generate inferences that enhance their understanding of a source medical text and the production of an effective translation of it.

Key Words: Medical Texts, Translation, Difficulties, Reading Comprehension Strategies.

LIST OF ABBREVIATIONS

AIDS: Acquired Immune Deficiency Syndrome

CPR: Cardiopulmonary Resuscitation

CLT: Communicative Language Teaching

D.P.I.: Drug Package Insert

EAP: English for Academic purposes

EBE: English for Business and Economy

ELT: English Language Teaching

EOP: English for Occupational Purposes

ERL: English Restricted Language

ESP: English for Specific Purpose

EST: English for Science and Technology

LGP: language for General Purposes

LSP: Language for Special Purposes.

MRI: Magnetic Resonance Image

NHS: National Health Services

NNS: Non Native Speakers

REM: Rapid Eye Movement

SERT: Self Explanation Reading Strategy

SIDS: Sudden Infant Death Syndrome

SL: Source Language

SLT: Source Language Text

ST: Source Text

STT: Scientific and Technical Translation

TL: Target Language

TLT: Target Language Text

TT: Target Text

UMD: Unified Medical Dictionary

WHO: World Health Organization

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General Introduction

General Introduction

1. Statement of the Problem

Translation in its different forms has always been used as a means of exchanging ideas in different fields and as a means of communication between different cultures. Medical translation whether for specialized or non-specialized types of audience is considered as an important area in the field of translation. Moreover, within the field of medical translation fall different types of translation that deal with medical topics. Thus, medical translation is one of the growing areas of translation which includes a number of genres ranging from less specialized forms of medical information to the more specialized forms of medical books, articles and journals. The medical translator deals with what is called "medical language" which differs from everyday language in the specificity of its terminology.

Due to the huge achievements and the vast development of science, the world is witnessing in the scientific fields, in general, and in the medical branches, in particular, hundreds of new coined words. The need to transfer such achievements into other languages is rather fundamental. Moreover, since the English-speaking countries are taking the lead in the medical fields, the major part of the medical jargon is of English origins. Consequently, medical English has been translated on an international scale to different languages among which Arabic rises as a good challenging example.

Although Arabic was once the language of medicine, it now struggles to keep up with the boundary of medical sciences through translation. It still suffers from inconsistency in translation, and in some instances, contradictions appear in translating medical terms. Indeed, the dominance of the English language over the other languages in the medical fields has

brought to the Arabic language serious linguistic problems to express this ever–expanding wave of newly founded terminology for which equivalents in Arabic can hardly be found.

2. Aim of the Study

All fields of translation are equally important and involve specific features, difficulties, and methods. However, translation in the medical field often involves talent and extensive knowledge of the subject matter. The translation of medical texts, generally, throws up many challenges especially in terms of terminology. Although some medical terms can be translated without any difficulty, others are tremendously difficult to translate. In addition, what makes the translation of some medical terms into Arabic more complicated is their complex structure. In the light of this, the present study aims to depict the student's translation of medical texts from English into Arabic, and to elicit the terminological problems they encounter while rendering the English source text into its Arabic equivalent. It also attempts to identify the importance of reading comprehension strategies in the production of an effective translation of medical texts.

3. Statement of the Research Questions

The present study attempts to answer few questions pertaining to students' performance in translating English medical texts into Arabic in the department of Letters and English Language at the University of Frères Mentoury, Constantine.

- What is the current situation of the translation of medical texts from English into Arabic?
- What are the strategies used by first years master students of English in their translation of medical texts from English into Arabic?

- What are the terminological problems encountered by students in their translation of medical texts?

- To what extent can reading comprehension strategies help to improve the students' translation of medical texts?

4. Assumption

We assume that first year master students of English at the department of letters and English Language face hard hurl difficulties in the translation of medical texts. They rely mainly on literal and transliteration procedures in the translation of medical terms.

5. Hypothesis

If students manage to use reading comprehension strategies to generate interferences that can help them understand medical texts, their translation will be more efficient.

6. Tools of the Research

To answer our research questions, assumption and test our hypothesis two research instruments seem to be the appropriate tools for the data collection in this study. They comprise a questionnaire for teachers, another one for students and pre-post tests.

The students' questionnaire aims to collect information on the students' knowledge concerning the characteristics of medical texts and the strategies allocated to their translation.

The teachers' questionnaire aims to collect information on the Teachers' perceptions related to the students' translation of medical texts from English into Arabic in terms of strategies, terminological difficulties and solutions. It attempts also to give an overview of their opinion toward the use of reading comprehension in translation.

The pre-test aims to depict the students' translation of a medical text and to elicit the stylistic and terminological difficulties encountered in its translation. It attempts also to evaluate the strategies adopted by students in their translations of a medical text.

The post-test: Evaluate students' use of reading comprehension strategies as an approach in the translation of medical texts.

7. Structure of the Study

The research is divided into seven chapters. The first four chapters present the theoretical foundation, whereas, the last three chapters comprise respectively two chapters related to the practical work and a chapter that overviews some pedagogical implications and suggestions for further research. Chapter one, as a point of departure is an attempt to overview of the scope of scientific and technical works. It provides an overview on the importance of EST in the dissemination of science and technology. Then, it describes the development of English in scientific communication and the effect of this dominance on Non Native Speakers, Third World Scientists, and Translation.

Chapter two presents an overview of the scope of scientific and technical translation and discusses the true nature of such translation. It presents first the numerous translation strategies that are involved in the process of translation. Then, it reviews several issues related to this type of translation with regard to its problems and intricacies.

Chapter three reviews the medical language and the medical translation. It starts with an analysis of English medical terms, the derivations of English medical terms and the derivations of Arabic medical terms. It also describes problems of equivalence in the translation of medical texts including neologisms, non-equivalents and terminological inconsistencies.

Chapter four focuses on the importance of reading comprehension in generating interferences that can help in understanding scientific and medical texts. First, it presents a definition of reading comprehension, then; it presents an overview of vocabulary development in students. It reviews some of the reading comprehension strategies. Finally, it highlights the impact of reading comprehension on translation practices.

Chapter Five is devoted to the students and teachers questionnaires from the department of Letter and English Language, at the University of Frères Mentouri, Constantine. It displays the questionnaire administration, description, analysis and interpretation of the results obtained.

Chapter Six covers the experimental research. First, it provides a description of the research design, participants and target investigation. It, then, presents the method, procedure and steps followed in building the instrument of the study. Finally, it includes a description and a summary of the main findings in relation to the research aim. Then, it states the comparison of the results obtained in the pre-post tests.

Chapter Seven provides some pedagogical implications underlying the translation of medical texts from English into Arabic. It emphasizes the importance of reading comprehension strategies in understanding the source text and producing an effective translation   of   it.

CHAPTER One

The Scientific Discourse and the Scientific Communication

CHAPTER ONE

The Scientific Discourse and the Scientific Communication

Introduction

It is unquestionable that English-Arabic medical translation is increasingly becoming a topic of much concern and importance today. Due to the huge achievement and the vast developments that the world is witnessing in Science and Technology and the dominance of the English on most of the scientific works, The Arabic language suffers from serious linguistic problems to find equivalents to all the new coined words and expressions. Indeed, the use of English as a universal scientific language creates distinct challenges for those who are not native speakers of English.

In the light of this, the present chapter displays first a theoretical overview of the important notion of English for Special Purposes (ESP) as a learner-centered approach by defining it first, then, by describing its origins, key notions, characteristics, and relatable types. This description is followed by an overview on the importance of EST in the dissemination of science and technology. Finally, the chapter describes the development of English in scientific communication and the effect of this dominance on Non Native Speakers, Third World Scientists, and Translation.

1.1. English for Specific Purposes

1.1.1. Definition of ESP

In the late 1960, the term ESP emerged in relation to the English language teaching. The term refers to the teaching of English for specific and utilitarian purposes. "It is an approach to language teaching in which all decisions as the content and method are based on the learners" reasons for learning." Hutchinson and Water (1987:19). Therefore, ESP is said to be a specific language in a specific sitting (i.e.; directed to a specific audience: learners or

professionals). It refers to the teaching of a specific genre of English with specific goals, careers or field of study. E.g.:

English for Academic Purposes ⟶ Students will enter English Speaking University.

English for Business and management ⟶ Students will enter Hotel and Tourism Professional English.

Widowson (1983: 5) considers the emergence of ESP as "a particular subdivision of the general activity of teaching English to speakers of other languages". According to Hutchinson and waters (op. cit.: 8), the English needed by particular group of learners could be identified by analysing the linguistic characteristic of their specialist area of work or study. Therefore, „Tell me what you need English for, I"ll tell you the English that you need" became the most prominent principle of ESP.

1.1.2. Characteristics of ESP

Although the approach of ESP has widely been used in the last three decades, there is still a controversial debate around its meaning of ESP. Some scholars described it as the teaching of English for any purpose, while others described it as the teaching of English for vocational and occupational purposes. Hutchinson and Waters (op.cit.20), for example, have defined ESP as an "approach" rather than a "product" meaning that ESP does not necessarily involve any particular kind of language, teaching material or methodology. According to them the fundamental function of ESP is to know: "Why does this learner need to learn a foreign language?"(Milavica, 2006 cf. Hutchinson and Waters, 1987). The rationale of learning English, thus, became the heart of ESP. However, Robinson (1980) has defined it as the teaching of English to the learners who have specific goals and purposes. According to him, these goals might be professional, academic, scientific etc. Similarly, Mackay and Mountford

(1978: 2) have referred to it as the teaching of English for "clearly utilitarian purposes". Yet, Strevens (1988) distinguishes between four absolute and two variable characteristics of ESP. He considers as absolute characteristics:

1. Designed to meet specific needs of the learners.

2. Related to content (themes and topics), to particular discipline, occupation and activities.

3. Centered on the language appropriate to these activities in syntax, discourse, and semantics.

4. In contrast with general English.

Strevens P. (ibid) views the variable characteristics of ESP as:

1. Restricted to the language skills to be learned (reading only).

2. Ttaught according to any pre-ordained methodology (Gatehouse, 2001 cf. Strevens, 1998, pp. 1-2).

Therefore, the emphasis made by Strevens (ibid.) is on "Specific English" that belongs to a particular discipline, occupation or activity. This definition makes it necessary that ESP courses should concentrate on the language, i.e. syntax, lexis, discourse, semantics etc., which is suitable to a particular discipline, occupation or activity.

Dudley-Evans and ST- John (1997) suggest a revised definition to the term ESP. According to them in term of absolute characteristics, ESP is:

1. Defined to meet specific needs of the learners.

2. Makes use of underlying methodology and activities of the discipline it serves.

3. Centered on the language appropriate to these activities in terms of grammar, lexis, register, study skills, discourse and genre.

In term of variable characteristics, Dudley-Evans and ST- John (1997) consider that:

1. ESP may be related to or designed for specific disciplines.
2. ESP may use, in specific teaching situations, a different methodology from that of General English.
3. ESP is likely to be designed for adult learners, either at a tertiary level institution or in a professional work situation. It could, however, be for learners at secondary school level.
4. ESP is generally designed for intermediate or advanced students.
5. Most ESP courses assume some basic knowledge of the language systems.

The definition Dudley-Evans presented is clearly influenced by that of Strevens (op.cit.1988). It has been improved by removing the absolute characteristic that ESP is "in contrast with general English" and replaced it with more variable characteristics. John and Dudley-Evens (op. cit.:298). From Dudley-Evans" definition, we can conclude that ESP should simply be seen as an approach to teaching or what Dudley-Evans" described as "an attitude of mind". Hutchinson and waters (op.cit.1987) state that: "ESP is an approach to language teaching in which all decisions as the content and method are based on the learners" reasons for learning".

The characteristics identified by Strevens distinguish ESP from General English are as follows:

Table 1.1: Strevens (1988: 13) Distinction of EGP from ESP

General English	English for Specific Purposes
‧ Is not directed to particular learners ‧ Does not take into consideration the learner‟s needs ‧ The language used is general ‧ Does not follow specific methods or skills in teaching	‧ Is directed to particular learners ‧ Takes into consideration the learners‟ needs ‧ Selective language: grammar, lexis, discourse, genre and register ‧ May but not necessary, follow specific methods or skills in teaching.

1.1.3. Development of ESP

Hutchinson and waters (ibid.) identified three common reasons to the emergence of ESP:

The first reason is related to the demand of a new world, a revolution in linguistics and focus on learners and method of language delivery. As to the first reason, they explained that the end of the World War II and oil crises were two periods which played an important role in the creation of ESP. These two periods boosted the need of English in Scientific, Technical and Economic domains.

The second reason was a revolution in linguistics. In the 60s and 70s century, most of the work of linguists was based on the way in which language is used in real communication contrary to the work of traditional linguists who set out to describe the features of language. Hutchinson and waters (ibid.) pointed out the way in which spoken and written English vary. According to them, a particular context in which English is used would necessarily impose the type of English. In other words, language varies according to the situation in which it is used and so are the methods of English language learning.

The third reason is related to psychology. In the past, more attention was given to linguistics; however, Hutchinson and waters (ibid.) consider the emergence of ESP to be more related to psychology than to linguistics. Indeed, in the 70s century more attention was given to the way in which a language is learnt. "There was a shift of focus from methods of language learning to the different learning strategies, different skills, different learning schemata, and different motivating needs and interests that are employed by different learners." Al Humaidi (2007:143). This led to the design of courses that meet the learners" needs.

1.1.4. Types of ESP

Many researchers have discussed about the types of ESP and most of them have grouped ESP into two main categories: English for Occupational Purposes (EOP) and English for Academic Purposes (EAP) (Hutchinson and Waters, 1987; Robinson, 1991). Yet, Carver (1983: 131-137) identifies three types of ESP: English as a Restricted Language, English for Academic and Occupational Purposes and English with Specific topics

1.1.4.1. English as a Restricted Language

ERL refers to the restricted repertoire used in special situations. This is the case of waiters and air traffic controllers in which the English repertoire is limited. Mackay and Mountfor (1978: 4-5) illustrated the difference between restricted language and language. They   state   that:

the language of international air traffic control could be regarded as „special", in the sense that the repertoire required by the controller is strictly limited and can be accurately determined situationally, as might be the linguistic needs of a dining- room waiter or air-hostess. However, such restricted repertoires are not languages, just as a tourist phrase book is not grammar. Knowing a restricted „language" would not allow the speaker to communicate effectively in novel situation, or in contexts outside the vocational environment.

Mackay and Mountfor (ibid.) note that the scope of English as a restricted language (ERL) is extremely limited which allows the learners learn English language for very restricted purposes and it trains the learners to handle specific situations in extremely limited linguistic settings. This kind of ESP teaching restricts itself to "limited number of phrases and expressions and these learners remain unable to use English in any setting other than the one they have been trained for" (ibid.).

1.1.4.2. English for Academic and Occupational Purposes

Carver (op.cit. 131-137) considers English for Academic and Occupational Purposes as the most important type of ESP although he abstains from developing it further. Hutchinson and Waters (op.cit.1987) have illustrated the subdivisions of ESP in an [1]"ELT tree". In the ELT–tree, ESP is divided into three main Branches: English for Science and Technology EST, English for Business and Economy EBE, English for Social Studies ESS. Each of these subject areas is further divided into two other branches: English for Academic purposes (EAP) and English for Occupational Purposes (EOP).

An example of EOP is "English for Technician", and an example of EAP for the EST branch is "English for Medical Studies".

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[1] ELT: Engish Language Teaching

Diagram1.1: Simplified ELT Tree (Mackay& Mountford, 1978)

English for Medical Studies	English for Technicians	English for Economics	English for Secretaries	English for Psychology	English for Teaching

EAP   EOP   EAP   EOP   EAP   EOP

EST   EBE   ESS   Firmary   Secondary   Tertiary Adut

ESP   General English

English a Mother Tongue   English as a Foreign Language   English as a Second Language

English Language Teaching
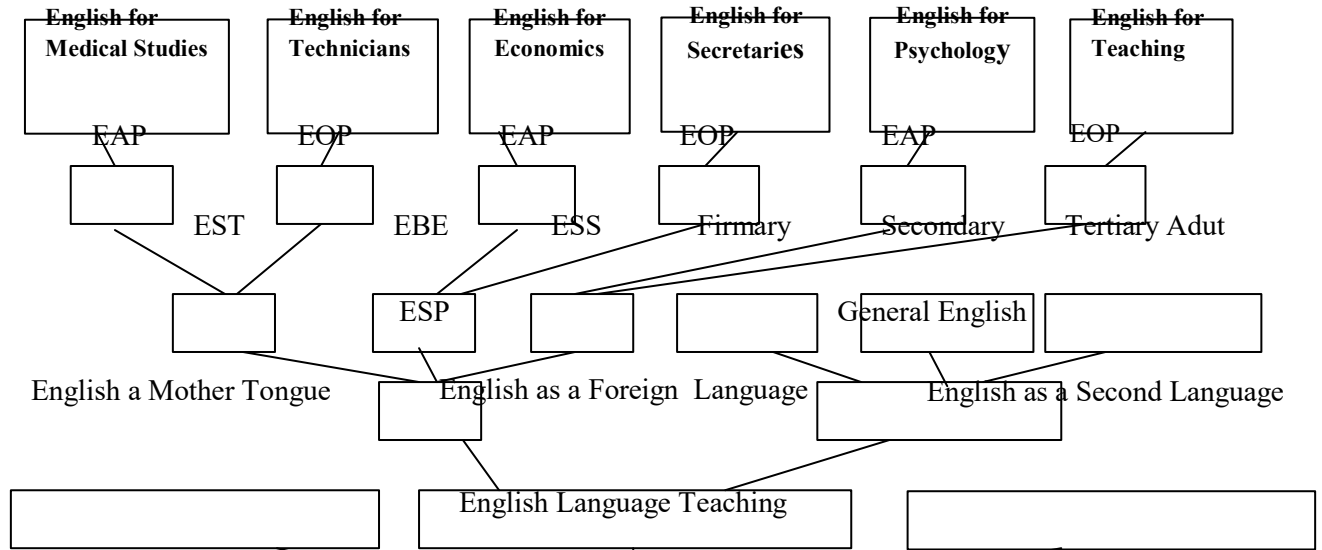
Hutchinson and Waters (op. cit.) do note in the above diagram that there is not a clear distinction between EAP and EOP. This means that people can work and study simultaneously, and that the language learnt in a teaching setting for academic purposes can be useful and employed by the learner in the occupational environment. This may explain why EAP and EOP have been categorized under the same type of ESP. The end of both types seems to be similar: employment. However, this will not lead to the conclusion that the means through which the same end is achieved are also identical. They are very different, indeed.

1.1.4.3. English for Specific Topics

Carver (Op.Cit.) indicates that English for Specific Topics differs from the other types of ESP. It gives priority to topics that are in agreement with the anticipated future English needs of learners, such as Scientists requiring English for post graduated reading studies, attending conferences or working in foreign institutions. It has been argued, however, that these types of ESP should be regarded as an integral part of ESP, with focus on situational language. The

situational language is determined from the interpretation of results from needs analysis of authentic language used in target workplace settings.

To conclude, Carvers (ibid.) distinguished three common features of ESP: authentic, materials, purpose-related orientation, and self-direction. These features are useful in attempting to make one''s understanding of ESP. Authentic learning materials are considered by Dudley-Evans' (1997) as completely feasible at an intermediate or advanced level. They are regarded as a feature of ESP, particularly in self-directed studies and research tasks. Purpose-related orientation, on the other hand, refers to the simulation and recreation of communicative tasks required for the target situation. Students, for example, in a simulation and recreation of a conference may involve: the preparation of papers, reading, note taking, and writing. Finally, self-direction is a feature of ESP in which learners are turned into users. In other words, learners should get a certain degree of freedom that enables them to take decisions related to their studies. On the other hand, teachers should help students to learn efficiently by teaching them some relevant learning strategies (Hutchinson and Waters, 1987; Dudley-Evans, 1997 and 1998; Shohamy, 1995; Douglas, 2000). Yet, Swales (1985: 214) points out that the most constraining factor to the development of ESP is the lack of "specialized teacher-training".

1.2. English for Science and Technology

1.2.1. The Emergence of EST

Throughout time, ESP has gained importance and received much attention among educational and applied linguists. This attention is justified by the dominance of English in the fields of economics, politics, media, technology and medicine. Each of these fields, as well as others, requires its own way of teaching based on the needs of their learners. Therefore, it is obvious that English for Science and Technology (EST) should be an important aspect of ESP. It plays a vital role in the spreading of science and technology. Accordingly, Hutchinson and

Waters, (1992) state that: "Learners were seen to have different needs and interests, which would have an important influence on their motivation to learn and therefore on the effectiveness of their learning"

English for Science and Technology (EST) emerged in the 1950s (Feng M.: 2000). It was the outcome of the rapid development of science and technology after World War II. Since the 1970s, EST has stimulated worldwide attention and led to much research among different nations. With more and more scientific papers published in English, EST which is different from the daily English and literary English, has emerged with its own typical characteristics. Now it has become a significant language variety. Peng (2005). In the same vein, Kennedy and Bolitho (1990) note that: "Much of the demand for ESP has come from scientists and technologists who need to learn English for a number of purposes connected with their specialisations. It is natural; therefore, that English for Science and Technology (EST) should be an important aspect of ESP programs"

EST, generally, refers to the written and the spoken language used in science and technology. It includes scientific books, papers, reports, experimental records and schemes; various scientific intelligence and scripts; the practical scientific handbooks (operative means including instruments, machines and tools); scientific films, videos and sound materials with the caption, etc. An important feature of English for Science and Technology is that its simple style is common to both written and spoken communication (Mei Feng: 1998).

EST has its own characteristics such as high-level specialization, new concepts, simple and clear language, more declarative sentences, extensive use of the passive voice, many complicated and long sentences, etc. Compared with other literary forms, it has higher-level scientific nature, organization, accuracy and closeness.

1.2.2. Definition of EST

According to Kennedy and Bolitho (1984), the term EST presupposes a stock of vocabulary, items, grammatical forms, and functions which are common to the study of science and technology. By this, they mean that EST is a specified learning lessons dealing with scientific content to be used by Scientists and Technologists for various special purposes such as presenting a Scientific or Technical paper at a conference, reading relevant literature or writing a paper propounding a theory and so on. Trimble (1985) states that: "EST is a spectrum/continuum extending from the peer writing of scientists and technically oriented professionals to the writing aimed at skilled technicians". It includes several types of instructional discourse, with various communicative purposes and targeted audiences. It is the first comprehensive view on the discourse of science and technology as a distinct variant of language in use.

In the Systemic Functional framework of EST, the focus is on "the language of science" seen as a functional variety or "register". One crucial aspect in the evolution of scientific discourse is the need to construct technical taxonomies. Recognizable resources of scientific discourse are nominalizations, high lexical density, nominal style and grammatical metaphor Timble (ibid.).

1.3. Definition of Science

There are several definitions supplied by different sources to the word "*science*". Webster's New Collegiate Dictionary (2009) defines science as "knowledge attained through study or practice," or "knowledge covering general truths of the operation of general laws, esp. as obtained and tested through scientific method and concerned with the physical world." In

addition, The Academic Press Dictionary of Science and Technology gives the following definition:

> *Science is: "1. the systematic observation of natural events and conditions in order to discover facts about them and to formulate laws and principles based on these facts. 2. The organized body of knowledge that is derived from such observations and that can be verified or tested by further investigation. 3. Any specific branch of this general body of knowledge, such as biology, physics, geology, or astronomy."*

Feynman (1999:462) sees Science as the belief in the ignorance of experts. According to him: *"Science alone of all the subjects contains within itself the lesson of the danger of belief in the infallibility of the greatest teachers in the preceding generation."*

In other words, science refers to a system of acquiring knowledge using a scientific method that helps to organize thought, procedures and then come into clear, faithful and reliable results.

1.3.1. Scientific Paper and Scientific Discourse

A scientific paper explains the scientist's motivation and impetus for doing an experiment, the procedures he used in carrying his experiment, the results he came with, and the interpretation of these results. The main objective of a scientific paper is to inform an audience about an important issue and to shed some light on the particular approach used to investigate that issue. According to Brewer (1980:221-239), a scientific text can be readily classified as an expository text whose primary function is to inform.

Scientific discourse is considered as the processes and methods used to communicate and debate scientific information. Discourse focuses on how to arrive at and how to present scientific ideas and information, taking into account different audiences. These audiences include professionals, students, teachers, the general public, business and government

organizations, or any other potential audience that may benefit from or contribute to scientific theory and consensus. Communication in scientific discourse refers to both written and spoken communication, and often involves specific style as well as vocabularies used to present information.

Indeed, scientific discourse constitutes a great concern among researchers who analyse various aspects of the scientific discourse from the smallest units such as pronouns, articles, verb forms etc... to the broadest ones like research papers, reprint requests and lab reports Slougui (2009:59). Kennedy and Bolitho (1984:8) note in earlier approaches to ESP, "Scientific English can be taught trough a general English syllabus with an overlay of scientific vocabulary". Eltinge and Roberts (1993:56-83) view the presentation of information in science textbooks as more likely to resemble a series of facts. Widdowson (1979:26-27) considers it as a "(…) kind of discourse, that is to say a way of using English to realize universal notions associated with scientific inquiry".

However, many linguists speak of scientific language as "supernatural language. According to Sapir (1921:239): "the proper medium of scientific expression is... a generalized language that may be symbolic algebra of which all known languages are translations" .In the same vein, Widdowson (1979:26-27) says: " Scientific discourse is a universal mode of communicating, or universal rhetoric, which is realized by scientific text in different languages by the process of totalization". He maintains that:

- The rhetorical principles such as (cause and effect, comparison, formulation of hypothesis etc…) integral to scientific knowledge can be found in wide range of linguistic expressions.

- Scientific discourse is also realized in different ways: symbols, Formula, diagrams…)" these nonverbal modes of communicating" bear witness to this universality and the independence of science from primary culture systems as reflected in different languages.

On the other hand, research in various areas revealed that scientific language is the product of primary cultures. In this context,Corbett says on that:

> *"Scientific language is determined by the idiosyncratic practices of the various communities of scientists in the world. If one considers translation of articles from one language to another, one can notice that there is more to the task than the simple recasting of a universal symbolic algebra".*

Therefore, the scientific paper contains a kind of discourse in which the use of language is specific. It should be written because its function is "(…) to treat scientific topics". Scientific English is a language variety which possesses characteristics of its own.

1.3.1. Features of the Scientific Discourse

The technical as well as the scientific use of language distinguish themselves from the literary one by several characteristics that are specific to these different registers. The most obvious ones are: objectivity, clarity, brevity, economy, consistency, non-deviation from ordinary grammar, logically and argumentative progression. This may involve the adherence to items that are conventionally used. There is no insertion, substitution, or permutation (van Dijk, 1976; Bell, 1991; Ghassib, 1996). Indeed, scientific texts underline the information content without bothering about features that are characteristic of poetic texts, such as rhyme, and connotative or symbolic meaning.

Yet, some scholars like strevence (1976:46), Ewer (1971:67), and Widdowson (1974:288) consider that there are other characteristics that are specific to scientific texts:

• Scientific texts are generally more straight-forward than other texts from a pragmatic-cultural viewpoint.

• The language is usually more formal (except for popular scientific texts) and less flexible than everyday language.

• There is frequent use of subject-specific graeco-latin terminology.

• There are long nominal groups and a greater lexical density.

• There is frequent use of the passive.

• Scientific texts are specialized in their terms, which normally have a word-for-word translation.

• Verbal forms are usually simpler in form and meaning than, for example, a narrative text.

• The „depersonalised" statement of the scientist

According to Parkinson (2000, 371), scientific texts are characterized by the following

features:

• Nominalization of verbs and adjectives, e.g. *A preoccupation with minor indiscretions from the past often occurs in such patients.*

• Technical phrases (medical jargon), e.g. *The patient presented with jaundice.*

• Extended nominal groups/collocations, e.g. *small middle meatal polyps*

• Tentative language (hedging) e.g. *Reduced attachment in the face of polymorph infiltration might indirectly reflect aspects of the immune response...*

• Causal and reasoning verbs, e.g. *Addiction is caused by heroin*.

• Impersonal language and passivisation, e.g. *The epidermis is molded over the papillae of the dermis.*

1.3.1.2. Style and Terminology in a Scientific Discourse

Aaronson (1977:4) considers language as the starting and the ending point of science. According to him, the principle by which phenomena are reduced to language is style (ibid.1977).

Yet, the scientific style is completely different from the literary one. The writer of literary texts is more expected to deal with style that provides the readers with enjoyment, and intellectual delight. The scientific writer, however, is more interested in facts, phenomena and concepts that are reflected through an objective, clear and concise piece of writing. Ilyas (1989: 109) describes the nature of scientific texts as follows:

> *In scientific works, subject-matter takes priority over the style of the linguistic medium which aims at expressing facts, experiments, hypothesis, etc. The reader of such scientific works does not read it for any sensuous pleasure which a reader of literary work usually seeks, but he is after the information it contains. All that is required in fact is that of verbal accuracy and lucidity of expression.*

Hence, the best style used in scientific writing should be transparent, brief, clear and concise with a standard format, where the reader sees through the words to the underlying, phenomena and concepts. In this light, the physicist John Rader Platt (1956:245) argues: "The failure to recognize a brilliant man is only partly due to the stupidity or stubbornness of the scientific community; it is also partly his own fault"

Yet, terminology is considered as an important feature, too, in technical as well as scientific writing, which implies the use of specific jargon and terminology instead of simple words and expressions. Pinchuck (1977:19), for example, claims that vocabulary is the most significant linguistic feature of technical texts. Many scientists are delighted by the fact that their specific jargon makes their field unintelligible for lay people and outsiders, leaving the impression that only experts can understand the deep mysteries involved Aaronson (1977:6). Thus, many of them prefer the use of such incomprehensible and clumsy words to dignify and distinguish not only the subject, but also the writer from the others. According to Zinsser (1976:15), "every profession has its growing arsenal of jargon to fire at the lay man and hurls him back from its walls."

Aaronson (op. cit.:6) maintains that one of the best definitions of style for scientists was written in 1948 by the atomic physicist J. Robert Oppenheimer. He observes:

> *The problem of doing justice to the Implicit, the imponderable, and the unknown is of course not unique to politics. It is always with us in science, it is with us in the most trivial of personal affairs, and it is one of the great problems of writing and of all forms of art. The means by which it is solved sometimes called style. It is style which complements affirmation with limitation and with humility; it is style which makes it possible to act effectively, but not absolutely: it is style which, in the domain of foreign policy, enables us to find a harmony between the pursuit of ends essential to us and the regard for the views, the sensibilities, and aspirations of those to whom the problem may appear In another light; it is style which is the difference that action pays to uncertainty; It is above all style through which power defers to reason.*

1.4. The Development of English in Scientific Communication

In the past, the scientific knowledge was mainly considered as an integral part of the scientific communication. It was described and transmitted in languages such as Greek, Latin or Arabic Slougui (2009:16). Yet, throughout time, the development of the English language and the spread of the scientific research have limited the use of other languages in the scientific communication. Hamel (2007:55) describes the history of language use in

scientific communication as a "paradigm shift" from a "plurilingual" to a monolingual model.

Until the 20th century many languages were involved in the scientific communication, and each language was mainly used in a specific field of science: French, for example, was the dominating language in political sciences; German was the indisputable language of medicine, biology and chemistry; and English was known to be the language of political economy and geology (Ammon, 2001). However, by the end of the 20h century, the English language gained importance over the other languages and became the dominant language of the scientific community. Strevens (1987:57) describes it as "a window on the world of science and technology".

In this view, as a consequence of the English development, most, if not all of the largest published scientific articles and journals are written in English. Moreover, as reported by Garfield for the SCI (1967, 1983, 1989, and 1992) studies on language use and international communication have shown that most of the world research in science is written and published in English. Slougui (op. cit.: 16).

The bellowing table below highlights the dominance of English over the other languages in most of the natural sciences.

Table 2: Share of Languages in Several Natural Sciences in 1996 *(Source, biological,*

chemical, physical Abstracts, Medline, Math Sci Disc in Hamel. 2007:58)

Languages	Biology	Chemistry	Physics	Medicine	Mathe matics	Natural Sciences (average)
English	91.6	83.2	94.8	88.6	94.3	90.7
Russian	1.9	3.8	0.2	1.6	3.2	2.1
Japanese	1.1	309	1.7	1.8	0.2	1.7
German	1.1	1.9	0.9	2.2	0.3	1.3
French	1.4	0.7	0.4	1.9	2.3	1.2
Chinese	0.8	4.2	1.2	0.1	1.1	-
Spanish	0.6	0.3	0.0	1.2	0.1	-
Italian	0.3	-	0.1	0.6	0.1	-
Portuguese	0.3	-	-	0.1	-	-
Other	0.9	1.1	0.7	0.9	-	3.0

The above table shows the dominance of English over the other languages in natural

sciences. The extensive use of the English language in scientific communication has led to a

serious decline of the other languages. This outmost dominance of English in the scientific

fields generated an extensive linguistic migration toward English for publication. "A great

number of non-English journal editors have adopted English as a house publishing language"

Slougui (op.cit:22).

The following table shows that whereas English papers indexed in the MEDLINE

database accounted for 53% in 1966 and 90% in 2000; the number and percentage of non-

English papers have continually decreased from 47% published in 1966 to 10% in 2000.

Table 3: Number and Percentage of Medline Articles by Language and Country of Publication (Med Lib Assoc 93 (3) july 2005)

Years	Total Medline journal articles	English	%	Non-English	%	Anglo Jounals	%	Non-Anglo Journals	%
1966	174,400	93,173	53	81,227	47	76,066	44	98,334	56
1970	213,066	125,496	59	87,570	41	98,663	46	114,403	54
1975	243,118	163,388	67	79,730	33	123,573	51	119,545	49
1980	258,329	185,536	72	72,793	28	137,870	53	120,459	47
1985	307,866	233,853	76	74,013	24	168,703	55	139,163	45
1990	367,568	293,265	80	74,303	20	214,027	58	153,541	42
1995	389,170	340,261	87	48,909	13	255,502	66	133,668	34
2000	468,191	419,108	90	49,083	10	317,705	68	150,486	32

Truchot (2001:320) emphasised that the most important databases are found in the USA and are the most widely used. Furthermore, international databases tend to favour not only publications in English but also publications originating from Anglophone countries. Moreover, Truchot (ibid.) continue to argue that 80% of the international journal are owned by "handful and powerful" American and British publishing houses, which use only English as the language of publication.

1.4.1. The Effects of the Dominance of English on Non Native Speakers, Third World Scientists, and Translation

The constant development of English over the other languages, and its utmost prevalence in the scientific field have led to many negative effects on the NNS (Non Native Speakers) especially those of the third world, and at the same time on Translation.

In fact, as a vast majority of the published scientific articles and journals are in our present time written in English, a very significant decline of scientific articles that are written in other languages is observed. English native scientists seem to be less ready to read scientific works in other languages than in English, even if the work is pertinent. Levin and Jordan (1981:438) explain that "they tend to bypass what they cannot read even if the work might be relevant to their own".

This situation created a kind of discrimination to the third word scientists, who are desperately trying to publish scientific works in their native language. Yet, due to the lack of the financial support, they fail to transmit their ideas and knowledge. Moatassime (1992:28) states that:

> *Les maghrébins risquent de se trouver tôt ou tard, si ce n"est déjà commencé devant un choix cornélien dans leur quête prioritaire de la science et de la technologie, indispensable au développement… Ils pourraient se détourner du français au profit de l"anglais, al „instar de l"Europe elle-même .d"autant que dans les colloques internationaux- saut la FIPE, les chercheurs et les universitaires maghrébins se trouvent de plus en plus marginalisés par une utilisation à outrance de l"Anglais, même par leurs collègues Français.*

> *(In their quest for science and technology, essential for the development, researchers from Maghreb countries may find themselves sooner or later, if this has not already begun, in front of a critical choice… They would have to switch from French to English, like Europeans themselves since in international forums- except for the FIPF-, researchers and academics from these countries are increasingly marginalized by an excessive use of English, even by their French colleges).* Doudja Slougui"s translation.

Swales (1985a, 1985b, 1979 1990, 1992) pointed out that only few scientific papers and articles coming from the third world are published in prestigious and well known journal; which are considered as "the preserve of developed countries". He said:

> *Overall, the role of NNS in this Anglocentric research environment remains rather obscure. The limited available evidence …indicates a relatively low level of NNS contribution to the "visible" English language research literature, and what contributions there are emanate principally from NNSs located…in Anglophone environments and from the more developed non Anglophone countries of the northern hemisphere. Hence, once again a North- South imbalance in the world- an imbalance reflected in the uncomfortable fact that numbers of able people in isolated and "off-network places are being excluded from actively participating in international scholarship and research.*

A closer look at the world scientific production of publication and its distribution by principal regions as illustrated in the bellowing (figure 1.1) shows that North America and Europe, clearly dominate the scientific output produced annually with respectively 36.6% and 37.5%. Together these countries account for the three quarters of the production of the world scientific and technical production in 1997. The remaining quarter represents many developing regions/countries inching up the scientific output.

Figure 1.1: World Production of Scientific and Technological Publications 1997, by Principal Regions *Source: observatoire des Sciences et des techniques (OST) Paris « Science et Technologie-indicateur. Slougui (op.cit.27)*
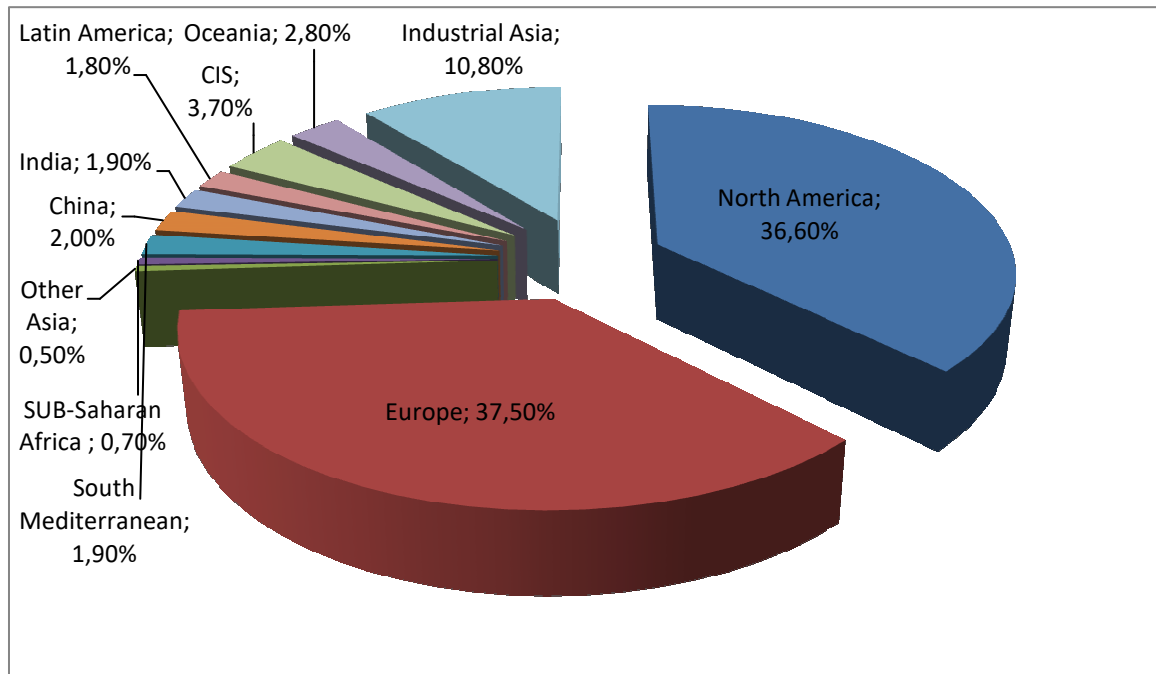
Levin and Jordan (op. cit.: 438) pointed out that when scientific researches and articles are published in other languages than the English language, their findings fail to reach the international audience because the English speaking scientists "read only what they can read easily in their native language, tending to bypass what they cannot even if the work might be relevant to their own". (ibid.).

The following figure shows the share of American, German, French and Russian in scientific publication throughout the century (1880-1980).

Figure 1.2: Proportional language use in Scientific Publications in the Course of One Century in America, German, French and Russian Bibliographies
(Source: Based on data collected by Tsunoda.in Ammon, 2001:344). Doudja Slougui (op.cit.18).
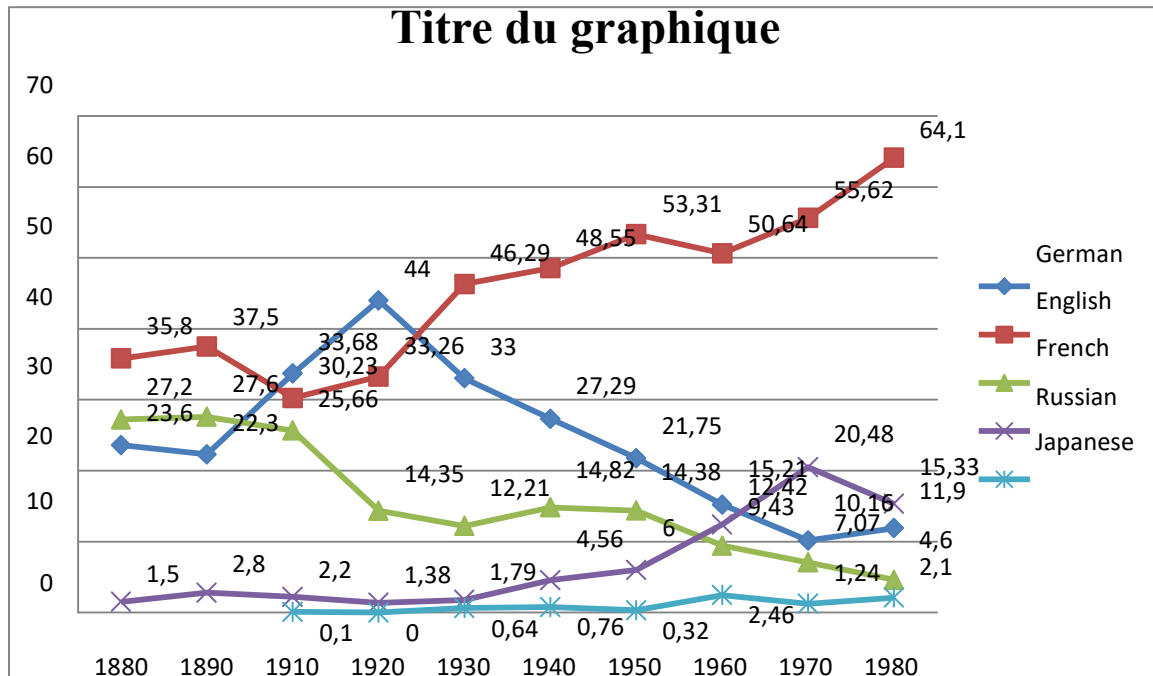
As can be seen, English, German and French held an almost similar ranking from 1988 until 1910. Yet, a noticeable French decline started in 1910, whereas, Germen achieved a significant rise in1920 outranking English publications for a while. English, however, witnessed a constant increase 1980 (64.1%), proclaiming the end of a "battle" between the "giants" Weber, (1987:17)

Conclusion

In a nutshell, this chapter is an attempt overview of the scope of scientific and technical works. It provides an overview on the importance of EST in the dissemination of science and technology. It describes the development of English in scientific communication and the effect of this dominance on Non Native Speakers, Third World Scientists, and Translation.

CHAPTER TWO

Scientific and Technical Translation

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Scientific and Technical Translation

Introduction

Translation has played a major role in communication between languages and cultures. Without translation modern technology could never have been transferred between nations. Translation can be applied to all fields of language including legal, religious, and literary language. Among these fields is scientific and technical translation (STT). Indeed, the development of EST in the last twenty years makes its translation a challenging task for learners especially in terms of terminology. Al-Ma'ni (2000) believes that while the understanding of the source text terminology is an important factor in the process of translation, the coining of equivalent target terms counterparts is of equal, if not, greater importance. In translating technical terms, one is often faced with the problem of neologism and non-equivalence. Such problems are caused by the rapid progress and the advances made in science and technology around the world which make it difficult for terminologists and specialists to deal with the huge numbers of terms that continually enter the language of science, which is usually English. Henceforth, as medical translation is a branch of technical and scientific translation, this chapter attempts to review the topic of scientific and technical translation (STT) and discusses the true nature of such translation. The chapter starts with a presentation of STT. Definitions of STT given by scholars, factors involved in STT and features involved in STT are presented. Then, the chapter moves on to discuss the problems of STT into Arabic with an emphasis on language and on terminological-related problems, in general.

2.1. Definition of Translation

There are different definitions supplied by different sources to the word translation. The Oxford Advanced Learner"s Encyclopedia Dictionary (1992:967) gives the following definitionto the word "**translate**":

"Translate: v: express (sth spoken or written) in another language or in simpler words"

The Webster"s New World dictionary defines the word "translate" as:

1. *to put into the words of a different language;*

2. *to put into different words; rephrase or paraphrase in explanation;*

Lewis (1958:265) states that "translate" is formed from the Latin "trans+latus", which means "carried across". Newmark (1988: 5) defines translation as "rendering the meaning of a text into another language in the way that the author intended the text". This definition stresses on rendering meaning of the source language text into the target language text as what is intended by the author.

Hatim and Munday (2004: 6) define translation as "the process of transferring a written text from source language (SL) to target language (TL)". In this definition they do not explicitly express that the object being transferred is meaning or message. They emphasize on translation as a process. Nida and Taber (1982: 12), on the other hand, state that "translating consists in reproducing in the receptor language the closest natural equivalent of the source language message". Ghazela (1995:13) sees translation as "(…) the processes and methods used to convey meaning of the source language into the target language". Those methods and

processes depend on SL text and the TL readers. Nida and Taber (op.cit.) explicitly state that translation is closely related to the problems of languages, meaning, and equivalence.

From the stated definitions mentioned above, it is found that translation is a process which is intended to find meaning equivalence in the target text. Machali (2007) and Mona Baker (1992) underline the term meaning equivalence because it is the meaning which is transferred in the target language.

Nida E. (1964: 161-164) explains the different definitions allocated to the term translation as follows: "Definitions of proper translating are almost as numerous and varied as the persons who have undertaken to discuss the subject. This diversity is in a sense quite understandable; for there are vast differences in the materials translated, in the purpose of the publication, and in the needs of the prospective audience"

Hence, "translation" can be considered as the act of replacing a text in one language by an equivalent text in another language using different methods and processes to convey the meaning of the source language into the target language. Foster (1958:1) considers it as the act of transferring through which the content of a text is transferred from the source language into the target language. Catford (1965: 20) points out that, "translation is the replacement of textual material in one language by equivalent textual material in another language". For Levy (1967:148), "translation is a process of communication whose objective is to import the knowledge of the original to the foreign reader". Similarly, Savory (1968:37) believes that translation is made possible by an equivalent of the idea that lies behind its different verbal expressions.

The diversity of the definitions allocated to the meaning of translation could be justified by the importance and the complexity of the translating activity, which aims at

making inter-linguistic communication between people possible, and where the source and the target languages are its key components. Hence, as pointed out by Bell (1991: 13) translation is a term with three distinguishable meanings:

1) Translating: is the abstract process and activity of rendering a source text into its Target equivalent.

2) Translation: is the product of the process of translating (e.g. the translated text).

3) Translation: is the abstract concept which includes both the process of translating and the product of that process.

2.2. Equivalence in Translation Theories

Since translation in, principle, is a kind of communication equivalence between the source text and the target text, it naturally becomes an essential requirement in translation. It is, generally, agreed that the fundamental requirement of any kind of communication is to guarantee that the message is adequately transmitted from the source to the receptor. Similarly, in translation, the translator should do his best to reproduce the closest equivalent message of the original text in the target text so that the target text reader can understand the source message adequately; otherwise, translation as a kind of communication would end in failure.

The notion of equivalence is considered, thus, as the central issue in translation. It is a constitutive feature and a guiding principle of translation. As Catford (21: 1965) points out, "the central problem of translation-practice is that of finding TL equivalents". A central task of translation theory is that of defining the nature and conditions of translation equivalence."

It covers linguistic units such as morphemes[2], words, phrases, clauses, idioms and proverbs in one language (like English) which carry the same intended meaning encoded in a specific linguistic medium in another language (like Arabic).Yet, it is undoubtedly one of the most problematic and controversial area in translation in which many different theories emerged.

Vinay and Darblnet (1995:342) view equivalence as a procedure which replicates an identical situation of the original using completely different wording. They distinguish between direct and oblique translation, the former referring to literal translation and the latter to free translation (ibid.342). Moreover, they propose seven procedures, the first three covered by direct translation and the remaining four by oblique translation. These procedures are: borrowing, calque, literal translation, transposition, modulation, equivalence and adaptation. In particular, it is argued that equivalence is viewed as a procedure in which the same situation is replicated as in the original but different wording is used (Vinay and Darbelnet, 1995, p. 32). Through this procedure, it is claimed that the stylistic impact of the source-language (SL) text can be maintained in the target-language (TL) text. Hence, when dealing with proverbs, idioms and clichés, equivalence for them is sought at the level of sense and not image. For example, the idiom "*comme un chien dans un jeu de quills*" meaning literally *"like a dog in a set of skittles"* could be translated like a bull in a china shop (cited in Munday, 2001:58)

In addition, Jacobson (1959:233) maintains that there are three kinds of translation:

- Intralingual (within one language , rewording or paraphrase)

- Interlingual (between two languages)

- Intersemiotic (between sign systems)

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[2] Morphemes: A meaningful linguistic unit consisting of a word (such as *dog*) or a word element (such as the -*s* at the end of *dogs*) that cannot be divided into smaller meaningful parts

Therefore, according to Jacobson"s theory (ibid: 1959) which is mainly based on his semiotic approach, translation involves two equivalent messages in two different codes. He goes on arguing that whenever a linguistic approach in translation is no longer suitable, the translator can rely on other procedures such as loan translation [3] and neologism [4].

Yet, Nida is much more interested in the semantic quality which is the message of the text. According to him, there are two types of equivalence: *"formal equivalence"* and *"dynamic equivalence"*. "Formal equivalence" consists of a target language item which represents the closest equivalent of the source language word or phrase. *"Dynamic equivalence"* is based upon "the principle of equivalent effect" (1964:159); that is to provide a translation that will have the same impact on the target reader as the original wording did upon the target audience. Nida (1984:83) maintains that "translation consists in reproducing in the receptor language the closest natural equivalent of the source language message, first in term of meaning and secondly in terms of style".

Nevertheless, Nida"s theory has been severely criticized for several reasons. Lefevere (1993: 7) holds that equivalence is still focused on the word-level whereas Broeck (1978:40) wonders how it is possible to measure the equivalent effect since no text can have the same effect or elicit the same response in two different cultures in different periods of time. Gentzler (1993:70-103) overtly criticizes Nida for using the concept of dynamic equivalence in order to proselytize readers, regardless of their culture, to endorse the ideas of Protestant Christianity. He (ibid.: 72) states that: "Nida"s arguments against Arnold"s approach are governed by his taste, general public opinion, and the economics of his project (converting

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[3] Loan Translation: a borrowing by which a specialized meaning of a word or phrase in one language is transferred to another language by a literal translation of each of the individual elements. It is also known as "calquing"

[4] Neologism: a word or phrase newly invented or newly introduced into a language.

people to Christianity). Implicit in his approach is a populist evangelical Christian belief (and anti-intellectual stance) that the word should be accessible to all".

Yet, despite these criticisms, it could be concluded that Nida moved a long way forward from the position of his predecessors because he was able to produce a systematic and analytical procedure for translators working with all kinds of texts and, more importantly, brought into the translation game, the readers; that is, the receptors, as well as their cultural expectations.

Catford"s approach to translation equivalence differs from that adopted by Nida since he had a preference for a more linguistic based approach to translation. His main contribution in the field of translation theory is the introduction of the concepts of types and shifts of translation. (1965:73-80)

Catford"s types of translation:

- Full translation vs Partial translation.

- Rank bound translation vs unbounded translation.

- Total translation vs restricted translation.

Catford"s shifts in translation:

- Structure-Shift: which involves a grammatical change between the structure of the ST and that of the TT

- Class-shift: when a SL item is translated with a TL item which belongs to a different grammatical class, for example, a verb may be translated with a noun

- Unit shift (changes in rank and class).

- Intra-system shifts (like when the SL singular becomes a TL plural).

Catford was severely criticized for holding a largely linguistic theory of translation. Snell-Hornby (1988.19-20) puts forward the claim that linguistics should not be considered as the only discipline which enables translation to take place, but that cultural, situational and historical factors should also be taken into consideration. Moreover, she goes on to claim that Catford"s definition of textual equivalence is "circular", his reliance on bilingual informants "hopelessly inadequate" and his example sentences "isolated and even absurdly simplistic" (cited in Leonardi, 2007, 87). However, Malmkjaer (2005.20) insightfully observes that one should bear in mind that when Catford defines translation as the replacement of SL textual material by TL equivalent textual material, he does not mean equivalent in meaning (cited in Malmkjaer, 2005, p. 24).

House (1977) is in favour of semantic and pragmatic equivalence. According to her theory, every text is placed within a particular situation which has to be correctly identified and taken into account by the translator. If the ST and TT differ significantly on situational features, they are not functionally equivalent and, therefore, the translation is not of high quality (ibid.:49). Moreover, House is primarily concerned with the concept of *"overt"* and "*covert translation"*. In an overt translation, there is no need to attempt to create a second original since in an overt translation, the TT audience is not directly addressed as in academic articles (ibid.:189). Yet, in a covert translation the TT audience is directly addressed and therefore, there is an attempt to produce a text which is functionally equivalent to the ST as in political speech or official papers (ibid. 194). Hence, House relates linguistic features to the context of both the source and target text.

Baker (1992) explores the notion of equivalence at different levels putting together the linguistic and the communicative approaches. She distinguishes between: *equivalence at the level of the word, grammatical equivalence, textual equivalence, and pragmatic equivalence.*

- Equivalence at the level of the word, in which the translator looks at words of the St as single units in order to find a direct equivalent term in the TT. (ibid.:11-12) .

- Grammatical equivalence related to the diversity of grammatical categories across languages. House claims that different grammatical structures in the SL and TL may cause remarkable changes in the way the information is carried across, and therefore may induce the translator either to add or to omit information in the TT. Among these grammatical devices which might cause problems in translation Baker focuses on number, tense and gender.

- Textual equivalence between St and TT which is an important feature in translation in providing useful guidelines for the comprehension and analysis of the ST,is therefore being of great help in the production of a cohesive and coherent text for the target audience.

- Pragmatic equivalence related to implicatures and strategies of avoidance during the process of translation. The goal of the translator is, therefore, to create the author‟s intention in another culture in such a way that enables the Target reader to understand it clearly.

To sum up, the different views discussed above indicate the importance of equivalence within the framework of the theoretical reflection on translation. It is one of the essential axes of translation since it functions as a reminder of the central problems a translator encounters during the translation process. Yet, the difficulty in finding equivalence seems to result in the impossibility of having a universal approach to this notion.

2.3. Scientific and Technical Translation (STT)

Scientific and technical translation is an essential element in translation studies. Modern technology affects all aspects of life and society and all branches of science including translation. Burke (1936:1). New scientific discoveries and innovations need to be spread through the world, and translation plays an important role in transferring this technology. It has played an important role in transferring knowledge of science and technology between nations throughout history. According to Krien-Kuhle (2005:1) *"Scientific and technical translation has always played a pivotal role in disseminating knowledge. Today, the domain of science and technology is the main area of translation work."* Montgomery (2000) also believes that scientific and technical translation has always played an important role in transferring knowledge during history. He considers that modern science and technology is closely linked to translation or, indeed, started as translation. The need for translation has grown rapidly as a result of the increasing demand for the spreading of information in the technico-scientific fields. Kingscott (2002:247) echoes Montgomery as follows: *"it has been estimated that scientific and technical translation now accounts for some 90% of global translation output"*. Byrne (2012:7) emphasizes the same point by saying that: "every *aspect of our lives has been swept along by a seemingly unstoppable wave of new inventions and technological advances*". These inventions and advances are accompanied at almost every step by translation in its capacity as a vehicle for disseminating scientific and technical knowledge. Moreover, Arab countries are going through a phase of modernization on a massive scale. Therefore, the translation of scientific material from English, as the language of science and technology, into Arabic is crucial. By the word "scientific" it is meant that the concept is directly related to science and can be defined as the information achieved by investigation and experimentation, analytically verified, structured and constituted under universal ideologies (Chambers Dictionary, 1992). On the other hand, "technical" can be

looked upon as meaning scientific information for applied practices. Byrne (op.cit.2) gives clear distinctions between technical and scientific text. He argues that: "While a technical text is designed to convey information as clearly and effectively as possible, a scientific text will discuss analyses and synthesize information with a view to explaining ideas, proposing new theories or evaluating methods."

Thus, it can be clearly seen that scientific translation deals with pure science in all its concepts and methodologies; whereas technical translation deals with the application of the scientific information in the practical world. Although the terms scientific and technical are not identical, these areas are grouped together in teaching translation. Byrne (ibid.:2) says: "The majority of translator training institutions offer modules with titles such as "Scientific & Technical Translation" or "Advanced Translation-Science & Technical" and presumably, this are a convenient way of organizing teaching provision."

As mentioned above, translation has a significant role in the distribution of information as well as in the transfer of science and technology. Byrne (2012) also gives some reasons for the increasing demand for scientific and technical translation (STT). He attributes these increasing demands to:

1. Scientific and technical translation in many respects represents the backbone of international trade and the scientific attempt which "fuels" it.
2. Every sold product or provided specialized service such as: (MP3 player, telephone conferencing systems, luxury cars, online shopping websites, mobile phone services…) will require the involvement of science and technical translators at some point in its life-cycle.
3. Scientific and technical translation forms a central part of modern industry and society. It is the subject of numerous laws, regulations and directives and many

international scientific journals, "even those which publish papers in various languages, require translations of abstracts at the very least". Byrne (ibid.:1)

Nowadays, scientific and technical translation (STT) is deemed to be more important after the invention of the internet which links the world and gives a great chance for all people of different languages to communicate and get new technology and information. The access to new technology and information can only be done through the translation of foreign technical publications. The huge advances in science and technology create an increasing demand for such translation since it makes it possible to access the world"s achievements in science and technology. EU Council Resolution of the European Union (1998-C411) states that for factories and stores to be able to sell or distribute their technical products and appliances legally, all technical documentations relating to the product must be translated into the language of the country where the product is to be sold. This indicates the important role of the technical translator in all scientific and technical fields including medical fields. Byrne (2007:16) points out that: *"... Directive 90/385/EEC*, which deals with medical devices, and Directive 76/768/ EEC, which relates to cosmetics, state that documentation must be translated and it must anticipate potential risks."

Thus, translation is regarded as an important method for the international exchange of scientific, technical, economic and medical information. Also, scientists who think and write in one language need to know about the work, ideas and results of someone who works and communicates in another language, which is a kind of information exchange. In this context Byrne (ibid.7) says on that: "Scientific and technical texts are produced in response to a demand for information of a scientific or technical nature; such texts are translated because someone in a different language community wants to access or use the information these texts contain."

To sum up, translation is the main means of transferring technological knowledge and information. Salama-Carr (1995: 97-101) state that without translation, the modern phenomenon of „technology transfer" would not exist.

2.3.1. Technical Translation

A technical text is a text characterized by the use of specialized terminology. Technical translation is concerned with the translation of these technical terms. In this regard, Ghazalla (1995:163) defines technical translation as: "The translation of scientific and technical terms of all kinds: medical, physical, chemical, mathematical, mechanical, technological, biological, agricultural, computer and other terms of the various branches of science."

It can be assumed that scientific and technical translation (STT) is distinct from other forms of translation by specialized technical terms which represent the main source of difficulty and challenge even for speakers of the source language (SL). The more technical terms appear in the source language (SL), the more problems arise in translating these terms into the target language (TL). Additionally, the more knowledge a translator possesses about the subject matter in the ST, the more accurate a translation will be. With regard to technical texts, Dickins et al. (2002:184) suggest that: "The term „technical" is not confined to natural science and technology. Any specialist field has its own technical terms and its own genre-marking characteristics... we shall be applying the term „technical" to texts written in the context of natural-scientific or technological disciplines."

To conclude, the function of the technical translator is to deal with technical terms, understand their meaning in the source language (SL) and, then, choose the appropriate equivalent in the target language (TL). All types of translation require the translator to be

competent in both the source language (SL) and the target language (TL) and to possess a good understanding of the style and terminology uses in technical texts. There is also another requirement, which is that the translator needs to be well-informed in the subject matter and in the specialized terminology of the technical fields.. Such technical terms cannot be ignored as they convey the main meaning of the text.

2.3. 2. Scientific Translation

It is undeniably clear that there is a tremendous interest in translation. Indeed, English–Arabic scientific translation is increasingly becoming a topic of much concern and importance today. It has, no doubt, contributed a great deal to connect various cultures of the world. There are numerous translation strategies available to translators such as:

- Modification; when dealing with two structurally or culturally different languages.

- Transposition (to change the order of words and phrases)

- paraphrasing (restating sentences in other form of words).

- Literal translation (word for word translation).

- Calquing (loan translation).

All these strategies are essential at various times when dealing with various texts. Nida (1964:223) points out that:

If the translation of scientific texts from one language to another participating in modern cultural development is not too difficult, it is not surprising that the converse is true- that translating scientific material from a modern Indo-European language into a language largely outside the reach of Western science is extremely difficult. This is one of the really pressing problems confronting linguists in Asia today.

The Scientific translation, thus, becomes a requirement for the acquisition and spread of technology all over the world. Yet, effective scientific translators must understand not only the fundamental science they are translating but also the principles of both the source language and the target language. According to Thivierge (2002:188), a biomedical writer, editor and owner of Technicality Resources, that understanding involves the recognition of cultural differences, which can be reflected through the optimal match between challenges and skills.

2.3.3. The Scientific Translator

There are important requirements that a scientific translator should have in order to achieve a good scientific translation. According to Thivierge (ibid.) "The work of scientific translators is to achieve one primary goal: to write information in a clear, concise, and accurate manner". He distinguished nine requirements that should be taken into consideration by the translator:

- Work appropriate for the intended audience

- Respect for choices made by the author

- Respect for references

- Understanding of sciences

- Understanding of languages

- Constructive questions

- Work suitable for publication

‹ Familiarity with current practices

‹ Timely exchange of work

Moreover, as has been stated by (Gasagrade, 1954: 335-40) according to London Institute of Linguistics, to be a scientific translator one should have:

‹ Broad knowledge of the subject-matter of the text to be translated;

‹ A well-developed imagination that enables the translator to visualize the equipment or process being described;

‹ Intelligence, to be able to fill in the missing links in the original text;

‹ A sense of discrimination, to be able to choose the most suitable equivalent term from the literature of the field or from dictionaries;

‹ The ability to use one's own language with clarity, conciseness and precision

‹ Practical experience in translating from related fields.

2.3.4. The English-Arabic Scientific Translation

The English-Arabic translation is a difficult and time consuming task that requires skills, intelligence, and mastery of both English and Arabic. Yet, the linguistic differences that exist between English and Arabic may help to provide efficient guidelines for translating English scientific texts into Arabic. Al-Hassnawi (2000) sets in his Article: Aspects of Scientific Translation: "English into Arabic Translation as a Case Study" some linguistic differences that exist between English and Arabic as follows:

Table 2.1: English vs. Arabic (ibid.)

English	Arabic
- Words are composite.	- Words are paradigmatic.
- Only few grammatical items are compound.	The majority of grammatical items are compound.
- Rigid word order.	- Flexible word order.
- Very few inflections	- Highly inflectional.
- Uses abbreviations, acronyms, formulae, and registers.	- Rarely uses abbreviations, acronyms, formulae, and cliches.
- Narrow range of gender distinction.	- Wide range of gender distinction.
- There is clear-cut tense-aspect distinction.	- There is no clear-cut tense aspect distinction.
- There is no dative or dual.	- Contains dative and dual.
- Scientific and technical terminology covers all relevant fields.	- Shortage of scientific and technical terminology that may cover all fields.
- Archaic expressions are almost outdated.	- Archaic expressions are still in use.
- Uses so many compound lexical structures.	- Uses few compound lexical structures.
- Metaphor and other forms of figurative language are reserved for poetic use of language and certain related fields.	- Metaphor and other forms of figurative language are very much frequent even in Modern Standard Arabic.
- Adverbs are mostly formed by the affixation of (ly) to adjectives.	- Adverbs are formed by prepositional premodification of nouns and adjectives; English prepositions such as before, after, above, over, below, under, behind, and between are adverbs in Arabic.
- Capitalization is sometimes used for semantic implication e.g. Mosaic, Nativity…. etc.	- Does not use any form of capitalization.
- Does not use vocalization.	- Vocalization has a semantic function.
- Punctuation has a bearing on the interpretation of texts.	- Punctuation has little bearing, if any, on the interpretation of texts.
- A part from such suffixes as (-ling and -ette) there is no paradigmatic diminutive in English.	- Paradigmatic diminutive exists.
- It has no diglossia.	- Diglossia exists.
- There are about twenty configurations of vowel sounds.	- Few vowel sounds used mainly in vocalization.
- There are no pharyngeal or glottal sounds except in the aspirated (H) and the colloquial glottal stop.	- Pharyngeal and glottal sounds are among the standard phonemes in Arabic.

From the mentioned table, it becomes obvious to. Al-Hassnawi that the act of scientific translation is sometimes guided by certain strategies. One of these strategies accounts for the systematic differences between the two languages concerned. Another, depends on the type of language used in any individual text. These two strategies are applicable in translating English scientific texts into Arabic.

2.3.5. Scientific Equivocations

2.3.5.1. The Relevance of Style in Scientific and Technical Translation

Style is considered as one of the most irritating and frustrating equivocation for technical and scientific translators. It generates a lively debate among translators who maintain that scientific and technical translation does not need to concern itself with matters like style, and those who assert that writing, whether in scientific, technical, literary or journalistic... etc domains should be intended to conform to the stylistic conventions that reflect the specific expectations of the target audience Wright (1993:70). According to Wright (ibid.), the view that sees stylistic factors as of little relative importance is most often espoused by in house translators who have had the specific experience of producing " for-information-only" texts for use by scientists and researchers who only need to maintain a general awareness of foreign research trends in their technical fields .Accordingly, Byrne (2006:2) claims that the view that sees style as secondary in scientific translation is completely unfounded and implies that technical as well as scientific translators have different linguistic and writing skills than other types of translators. He goes on arguing that this problem is perhaps due to the differing opinions of the nature of style and the popular belief that it is exclusively related to literature. Indeed, literature is considered as an art which is reflected through language, so, if we look at style from a literary point of view, it does not have any place in technical translation. But, if we regard style as the way we write things, the words we choose and the way we construct sentences, then style is equally important in

technical as well as scientific translation than in other areas because it is therefore a reason, not simply for artistic or entertainment reasons. As Zethsen (1999:72) asserts, literary texts "do not hold a monopoly on expressivity and creativity".

2.3.5.2. The Specialized Information in Scientific and Technical Translation

The other noticeable Equivocation is that there is a common belief that the main concern of technical as well as scientific translation is restricted to convey information which is not entirely true. It is unquestionable that the main concern of technical as well as scientific translators is to make sure that information is conveyed accurately, but, they are also responsible for ensuring that the information is presented in the correct form, that it is complete and that the information can be used correctly and effectively Byrne J. (2006:3). Consequently, the translator"s responsibilities include many of those of the technical author. He also emphasized that:" technical translation involves detailed knowledge of the source and target cultures, target language conventions, text type and genre conventions, register, style, detailed understanding of the audiences; whether translators realize it or not, an understanding of how people learn and use information".

2.3.5.3. Scientific Terminology

Yowel and Lataiwish (2000:152) pointed out that one of the misapprehension and equivocation related to scientific translation in, general, and Arabic, in particular, is closely related to terminology. According to them (ibid.), Purists insists that in scientific translation, the translator should search into the Arabic vocabulary in the hope of finding an equivalent for the foreign word before coining a new term. Yet, only if such an equivalent is not found, then, the translator is allowed to (invent) a new item. Moreover, new established coinages are sometimes severely criticized by critics who claim that they have found on Arabic words

which convey the same conception expressed by the new one, that is to say, there is no need to try to find new words to express new concepts since they can be found in older Arabic.

Hence, the two misapprehensions pointed out by Yowel and.Lataiwish (ibid. 126) are: first, related to the linguistic nature of the scientific term, and second, to the nature of the language itself.

They argue first, that every discovery of a product or an idea is like "a new born baby" that needs a name. In addition any old Arabic term may be chosen and given a modern sense, since the relation between the term and the referent is basically arbitrary. There is no justification for wasting time and energy looking for an exact Arabic equivalent of the foreign term or replacement of a well-established term by a new one.

Secondly, they regard the view which claims that the translator is required to search thoroughly for the vocabulary of the language before he is allowed to coin a new term as erroneous because it sees language as a product rather than a dynamic process. Yet, vocabulary is an open ended component of language and it is not always possible to find items that match the new terms. The only aspect that has to be critically followed by the translator is the coining of new items that correspond to the phonological and morphological rules of the target language. He added that the condition for a successful term is that it is accepted by the user of the language and becomes established gradually.

Conclusion

To sum up, this chapter tried to present an overview of the scope of scientific and technical translation. It presented first the numerous translation strategies that are involved in the process of translation. Second it attempted to discuss the several issues related to the scientific translation, which yielded that translating scientific and technical terms is not a simple task for the translator. It rather involves skills, mastery of the two languages (English and Arabic), and broad knowledge of the subject matter. It also requires imagination and

talent in coining words that suit the new items, and then the use of a style that helps the reader not only to get the information, but also to understand, the principles, concepts and metaphors that the author wanted to convey.

CHAPTER THREE

The Medical Translation

CHAPTER THREE

The Medical Translation

Introduction

Medical translation is considered as ‒the most universal and oldest field of scientific translation because of the homogenous ubiquity of the human body‖ Fishback (1962: 462). Medical translation as a branch of scientific translation needs to achieve a high degree of consistency in transferring the source text message into the target language. Yet, for different reasons, medical Arabic nowadays suffers from terminological inconsistency; the matter that frustrates attempts aimed at making the Arabic language the official medium of instruction in medical colleges throughout the Arab world (Yasseen 2013:5). Due to the linguistic differences that exist between English and Arabic, various types of equivalence emerged and different medical Arabic terms are used to refer to the same foreign English medical term. For example, having different source languages (English and French) from which medical Arabic seeks the largest portion of its corpora, different bodies of translation that work individually, and multiple codified lexical resources are considered among major causes of multiplicity of terms that is reflected in terminological inconsistency (ibid. 6). However, terminological inconsistency is believed to result mainly from the absence of clear criteria upon which translators should make their choices when conducting translation of medical texts and this is further evidenced in the fact that the type of the target audience and its level of professionalism and education usually go unheeded in the translation process. In this light, the present chapter reviews the medical language and the medical translation. It starts with an analysis of English medical terms, the derivations of English medical terms and the derivations of Arabic medical terms. It also describes problems of equivalence in the

translation of medical texts including neologisms, non-equivalents and terminological inconsistencies.

3.1. Definition of Medicine

There are many definitions allocated to the word ―medicine‖. The American Heritage Medical Dictionary (2005) distinguished four main definitions:

1. The science of diagnosing, treating, or preventing disease and other damage to the body or mind.

2. The branch of this science encompassing treatment by drugs, diet, exercise, and other means.

3. The practice of medicine.

4. An agent, such as a drug, used to treat disease or injury.

Mosby's Medical Dictionary (2009) defines it as:

1. A drug or a remedy for illness.

2. The maintenance of good health using different techniques.

3. The art or technique of treating disease with or without surgery. Two major divisions of medicine are academic medicine and clinical medicine. Some of the many branches of medicine are environmental medicine, family medicine, forensic medicine, internal medicine, and physical medicine.

The word medicine is said to be derived from the Latin words ―ars medicina‖, meaning the art of Medicine. It is a branch of science, which includes a large and diverse set

of systems of diagnosis, treatment, and prevention based on various methods and techniques. At the beginning, It principally existed in the form of plants and herbs which were used in the maintenance of health and in the treatment of diseases, but, as it started to develop, and as people learnt more about pharmacology, they began to replace the herbs and plants with drugs and other chemical medicines as did the German scientist, Domagk, who realized the benefits of drugs in the prevention of disease from its spread.

3.2. Development of Arab Medicine

In early times, very few scientific facts were known. So, death and disease were often regarded as something supernatural rather than natural events and occurrences. So, if you were sick, it was because you offended the gods. But even a very primitive form of medicine required certain knowledge (Saad, Azaizeh, Said. 2005:475–479). Consequently, Saad, Azaizeh, Said. divided the history of Arab medicine into three phases, characterized briefly as follows:

a. **Phase 1:** The translation of medicine from Greek into Arab

b. **Phase 2:** The development of the Arab medicine

c. **Phase 3:** The development of medicine from Arab into Latin.

The first phase was the period of translation of Greek scientific and philosophical works into Arabic. This translation started in the eighth century AC when Islam rained over the world. (ibid.475–479).It covered nearly two-thirds of the known world, and contacts with the West were already established through Byzantium, Spain and Sicily. Hence, The Khalifs in Baghdad became aware of what needed be learned from Greek science, and in the reign of al-Ma'mun, an institution was founded for this purpose. This institution was called _The House of Wisdom'. The most famous of all the translators was Hunayn Ibn-Is'haq. He and his team translated a large number of medical works of Hippocrates and Galen, as well as

philosophical works by Plato and Aristotle and mathematical works of Euclid and Archimedes. As a result of these translations, hospitals and medical schools flourished during that period, first in Baghdad and later in the main provincial cities. (ibid.475–479)

The second phase was characterized by the dominance of the Arabic medicine, when the topmost works of Galen and Hippocrates were made available in Arabic, Christians lost their monopoly of medicine, and several Muslims reached a very high status in medical science that they stood far above their immediate predecessors and –were roughly *"on a level with the greatest of the Greeks‖. (ibid475–479).* Some notable scholars of the science of Arab medicine were as follows: Al Tabbari (838–870), Al Razi (Rhazes) (846–930). Al Zahrawi (930–1013), Avicenna (980–1037), Ibn Al Haitham (960–1040), Ibn Al Nafees (1213–1288) and Ibn Khaldun (1332–1395). (ibid.475–479)

The third phase of Arab medicine started in the twelfth century when European scholars started to be interested in science and philosophy and came to appreciate how much they had to learn from the Arab medicine. As a result, they started studying Arab works in these disciplines and translating the topmost of them into Latin. Saad, Azaizeh, Said (ibid.) Consider that among the most outstanding writer on medicine in Arabic was Ibn-Sina or Avicenna, as he was called in the West (dated 1037) and Al Razi, who wrote on many subjects and was accounted to have been greater as a philosopher than as a physician. Nevertheless, his vast –Canon of Medicine‖ is rightly acclaimed as the –culmination and masterpiece of Arab systematization‖. It was translated into Latin in the twelfth century and continued to dominate the teaching of medicine in Europe until the end of the seventeenth century. Saad, Azaizeh, Said. (ibid.475–479).

The following table shows the use Herbs for medicinal purposes. These Herbs come in different forms. The used parts may include leaves, flowers, stems, roots, seeds and berries.

Table 3.1: **Local Medicinal Herbs and their Uses to Treat Various Diseases According to Arab Medicine** (Source: Saad, Azaizeh, Said. (ibid. 475–479))

Disease	Number of plants used	Examples
Skin diseases	40	*Alchemilla vulgaris*, *Anchusa strigosa*, *Calotropis procera*
Kidney and urinary system	27	*Ammi visnaga*, *Brassica napus*, *Glycyrrhiza glabra*
Diabetes	26	*Achillea millefolium*, *Allium cepa*, *Allium cepa*
Digestive system	23	*Ceratonia siliqua*, *Foeniculum vulgare*, *Micromeria myrtifolia*
Liver disease	22	*Allium cepa*, *Asparagus officinalis*, *Cynara scolymus*
Respiratory system	16	*Anchusa strigosa*, *Anchusa strigosa*, *Brassica oleracea*
Cancer	13	*Allium cepa*, *Arum palaestinum*, *Brassica oleracea*

3.3. Medical Discourse

The Medical language differs from the everyday language in many ways, since it is related to the languages for specific purposes. This specificity is related to the specialized terminology that differentiates the medical language from the other languages. (Herget, Alegre: 2009). These languages for special purposes are part of the language system and can

be classified in different ways. The classification is always difficult, since these languages are in constant development and partially overlap with everyday language. Hoffmann (1985) presents two distinct ways of classifying languages for special purposes: a vertical and a horizontal division. The horizontal division is made on the basis of different knowledge domains and is characterized by its open structure, which means that, due to the evolution of science, new areas are continuously born. The vertical division is based on the level of abstraction, the text genre, the speakers involved etc.

3.4. The Medical Terminology

Medical terminology is defined as the specific language used for the exact and accurate description of all the components, conditions and processes of the [5]anatomical structures. It is based on a methodical and an organized approach to word building using (1) word roots, (2) prefixes, and (3) suffixes (ibid.). ‒The word root‖ is generally located in the middle of the word and signifies the basic meaning. ‒The prefix‖ comes before the word root and modifies the word's root by revealing further information about location and area of the body, the number of parts, or time involved. ‒The suffix‖, is located at the end of a word root, and works as an ‗inflectional ending' that conveys specific features, including the circumstances, development and procedure regarding the condition. Davies (1985: 13) defines medical terminology as ‒the study of words used to communicate facts and ideas particular to medicine; it is primarily concerned with the present use and meaning of such words.‖ Hence, medical terms refer to words, compounds, abbreviations and acronyms that

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[5] Anatomical: Adjective belonging to Anatomy.

Anatomy: **1.** The structure of an organism or any of its parts.
       2. The scientific study of the shape and structure of organisms and their parts.
The American Heritage® Science Dictionary Copyright © 2005

are related to medicine. According to Garsa (2015), in terms of origin, medical terminology can be classified under three groups:

A. Words which are taken from ordinary English vocabulary.

B. Words which are taken from another language.

C. Words which have been invented.

Albin (1999) believes that Latin is the language of choice for anatomical nomenclature, whereas Greek is the language of choice for pathology[6]. On the other hand, Davies (1985) believes that most medical terms are of Greek origin. He (ibid.) explains the reasons for the Greek origin of medical terms as being due to the physicians of ancient Greece, among whom was Hippocrates (born circa 460 BC on the island of Cos), who was the first to introduce scientific methods into medicine. John (2005) presents more reasons for the Greek origins of medical terms. He argues that:

> *Modern Western medicine traces its roots to the 5th century BCE, when the Greek physician Hippocrates (460-377) first attributed illness to physical causes, distinguished medical practice from priestly ministrations, and taught diagnosis by observation and treatment by fostering or restoring natural processes. Hippocrates and his disciples and successors, notably Galen (CE 130–201), produced a large and diverse body of medical writings in Greek. Many of the anatomic, pathologic, and therapeutic terms found in those writings remain in use today, some with little or no change in meaning.*

The process of creating medical terminology is not a simple task; it requires linguistic rules that should be applied. Indeed, in forming a word root, one needs a basic comprehension

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[6] Pathology: (Medicine plural pathologies: the study of the essential nature of diseases and especially of the structural and functional changes produced by them

of the term and the source language and the study of its [7]etymology which results mainly from the coining of both Latin and Greek languages. Moreover, when a term is developed, it should, generally, include a vowel -**o**- following the term, to have ‗a smoothing action' to the sound of the word when applying a suffix. However, Prefixes do not require further modification to be added to a word root because the prefix generally ends in a vowel or vowel sound. Serena Spinello (2001) (an active member of the American Medical Writers Association, Academy of Medical Educators, and the National Association of Social Workers) illustrated in her article –The History of Medical Terminology‖ the formation of the medical terminology with the word „**myocarditis**‟. Acording to her, the word **myocardities** is formed with the Greek prefix **my/mys**, meaning (**muscle**) added to combining "**o**" form; to obtain "**myo**." If we add the Greek root word "**cardio**" meaning (**heart**), and the suffix "**itis**" meaning (**inflammation**), we have formed "**myocarditis**," meaning a muscle layer of the heart that is inflamed.

3.5. Features of Medical Language

Herget and Alegre (2009) explains that medical language belongs to the languages for special purposes which differ from everyday language in the specificity of their terminology, and the fact that they are frequently used in communication between professionals and in specialized contexts. These languages for special purposes are part of the language system and can be classified in different ways. However, since these languages are in constant development and overlap with everyday language to some extent, such classification appears to be difficult. (Haddad 1997: 9-10) defines medical language more specifically as a subcategory of the language of science which is characterized by the use of the present tense, abbreviations and compounds. Precision and objectivity are highly valued in the language of

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[7] Etymology: the study of the origin of words and the way in which their meanings have changed throughout history http://oxforddictionaries.com/definition/english/etymology

science. Another related classification of medical language is made by (Newmark 1988: 151-153) who describes medical language as a subcategory of technical language. Technical language is in general distinguished from other varieties of language by terminology. Moreover, the style of technical language is usually objective, and free from connotations and sound effects. Technical language, especially in the case of the English language, is characterized by the use of passives, impersonality, empty verbs, third persons, and nominalizations. In terms of medical vocabulary, Newmark (1988: 153) suggests three levels of technical language as follows:

1. Academic: This level includes transferred Latin and Greek words associated with academic papers, e.g. 'phlegmasia alba dolens'

2. Professional: This level refers to formal terms used by experts, e.g. 'epedemic parotitis', 'tetanus'.

3. Popular: The popular level denotes the layman vocabulary, which may include familiar alternative terms, e.g., 'chicken pox'.‖

Löning, (1981:79-92) suggests a more comprehensive typology which differentiates four main levels according to the degree of specialization among the communicating partners and the aim of the text in medical contexts:

1. Professional - professional (doctor - doctor). At this level the aim is to transfer specialized knowledge in the style of scientific texts as in summary reports.

2. Professional - semi-professional (doctor - medical student/health personnel). At this level, the aim is to transfer basic knowledge in an instructional style as in handbooks and course books.

3. Professional - non-professional (doctor - patient). At this level, the aim is to educate nonprofessionals as in writings on patient education and instruction.

4. Non-professional - non-professional (journalist - reader). At this level, the aim is to turn problems public in the style of popular science texts as in articles, and magazines of general interest (as cited in Herget & Alegre, 2009).

Medicine, as many other fields, has its own specific language, and the most obvious feature of medical language is medical jargon (Krulj,Prodanovic & Trbojevic, 2011: 170). The medical jargon used in different medical texts is the most prominent feature that distinguishes medical language not only as being a specialized language as opposed to the general language, but also as being different from other types of specialized categories of the language of science.

3.5.1. General Features of English Medical Language

It is well-known that English is the leading language of medical sciences. To doctors, communication in English has been indispensable throughout the history of medicine (Krulj et al., 2011: 170). Thus, it is hard to fully understand the nature of medical language without having some access to the features of English medical language.

3.5.1.1. Lexical Features

Medical English distinguishes itself by the huge use of pure medical words (Yan, 201: 235). English medical terminology can be divided into the following subcategories.

3.5.1.2. Greco-Latin Terms

As long as English medical terminology is concerned, the first thing that comes to mind is the terms of Greco-Latin origins as they comprise the substantial part of the overall lexical body of medical knowledge. Morrow (1998:14) considers Greek and Latin as the basis of medical terminology because they are precise and internationally comprehensible (Berghammer 2006:40). Medical English is rich with morphologically complex words which are made up of Latin or Greek roots and affixes. Haddad (1997: 5-6) classifies the medical term groups in relation to Greco-Latin origins as follows:

1. Words Using a Prefix and a Free Root:

Prefix Root Example: Pre mature ⟶ premature

1. Words Using a Root and a Suffix:

Root Suffix Example: Bronch –it is⟶ Bronchitis

2. Words Made up of Two Roots (compound words):

Root Root Example: Head ache ⟶ Headache

3. Words Using Combining Forms:

Combining forms are made up of a combining vowel plus the root (Chabner, 2009:3). For example, the word ‒Hemat/o/logy‖ is made up of the root ‒hema‖ and the suffix ‒logy‖ with a combining vowel ‒o‖ that English Language has introduced to mark the different parts of the compound words (ibid.2009: 2).

4. Words Using Bound Roots Only:

Prefix Suffix Example: An- - emia ⟶ Anemia

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5. Words Using a Prefix, a Root, and a Suffix:

Prefix Root Suffix Example: Peri- card -it is ⟶ pericarditis

Such words are called neo-classical compounds, and they are present in different areas of medical vocabulary including anatomy, diseases, and procedures (Deleger, Namer & Zweigenbaume, 2009: 48). Albin, (1999) considers that Latin as the language of choice for anatomical nomenclature, whereas Greek is the language of choice for pathology. For example, there are two roots -Latin and Greek- for the word **kidney** which are used in different senses. The Latin root is **REN**- which is used with the suffix **Alto** make up the anatomical word –pertaining to kidney‖. The Greek root is **NEPHR**- which describes an abnormal condition **"Nephritis"** or a procedure **"Nephrectomy"** where an inflammation of the kidney, and a surgical removal of the kidney are denoted respectively (Chabner, 2009: 14). According to Yaseen (op.cit. 24-25), the meaning of a compound word is often extracted from the combination of the meaning of its constituent parts. She goes one arguing that one interesting aspect of English medical Greco-Latin terms is that they are transparent in that medical students can identify the meaning of a word eventhough they have not encountered it before by simply recognizing the meaning of the roots, suffixes and prefixes of which that word is composed. For example, a long word such as **"gastr/o/enter/o/logy"** can be understood quite easily as the study of **intestines** and **stomach**, when it is divided up to **gastr** (a root means 'stomach'), **enter** (a root means 'intestines'), and **logy** (a suffix means 'study of') (ibid.25). Medical English either purely borrows Greco-Latin terms without any alternations as in **phlegmasia alba dolens** (a disease related to deep vein thrombosis), **fascia** (a sheet of connective tissue covering or binding together body structures) or, adapt them, hence, making them overtime an integral part of English language such as **"pericardium"** instead of the Greco-Latin **"perikardion"** which according to Merriam Webster online medical dictionary,

refers to – the conical sac of serous membrane that encloses the heart and the roots of the great blood vessels of vertebrates‖ (ibid.26).

2. Collocations: "A collocation consists of two or more words used in normal association with one another in a given language together to form one word group- for example "benign" and "malignant" collocate with –tumour‖ (Newmark, 1979:1406). Vakhotskyi (considers that in medical English collocations such as –medical aid‖,‖ premature fetus‖, –blood test‖, –upset stomach‖, –admitted to hospital‖,‖ prescribe treatment‖, –adjust the dosage‖ and many others are specific for that type of language though they may be understood by people, who do not practice medicine. However, there are some strong combinations of words which are only clear to medical professionals, like –grumbling appendix‖.

3. Abbreviations and Acronyms: Kasprowicz (2010:14) defines abbreviations, on the one hand, as shortened forms of words or phrases that are spelled variously according to the rules of different languages, e.g. MRI (Magnetic Resonance Image), CPR (Cardiopulmonary resuscitation),…etc. Acronyms, on the other hand, are words created from a sequence of one to several capitalized initial letters or syllables. The most vivid example of acronyms is AIDS (Acquired Immune Deficiency Syndrome). Other examples are REM (Rapid Eye Movement), SIDS (Sudden Infant Death Syndrome),..etc. Medical English employs a great deal of abbreviations and acronyms. The popularity of such shortened forms in medical language is due to the historical tradition of the language of medicine, and the economy in space and time they provide **(Kasprowicz , 2010)**. Newmark (1979: 1405) has interestingly argued that one of the distinguishing lexical features of medical language is –the universal craze for creating acronyms (not just to seek fame, but often because the writer is too   lazy   to   repeat   a   multi   noun-compound)‖.

4. Eponyms: "A law, theory, theorem, hypothesis, principle, rule, formula, equation, disease, etc. named after a person is called an eponym" (Kalyane & Kadam, 2002: 172). Eponyms usually involve honoring a prominent physician scientist who played a major role in the identification of the disease. There are many eponyms in medical English e.g. [8]**Achilles tendon,** [9]**Crohn disease,** [10]**Cushing syndrome**,..etc. Eponyms are used because they are a simpler way of describing complicated syndromes, procedures or diseases. There are also interesting trends in the spelling of eponyms. The traditional spelling pattern entailed that these terms be formed as possessives, indicating in somehow that the disease or procedure belonged to the individual who was first to discover it, e.g. **"Crohn"s disease"**. Nonetheless, spelling patterns have changed over the past few decades. There has been a tendency to omit the apostrophe **Crohns disease-** and, more recently, to eliminate the possessive altogether **"Crohn disease"** (Hall, 2006: 1134).

5. Neologisms: Neologisms can be defined as "newly coined lexical units or existing lexical units that acquire a new sense" (Newmark, 1988:140). As a consequence of the rapid development in medical fields and the largely increasing number of pharmacological discoveries, neologisms are constantly created. In medical English, neologisms are present mainly in the names of drugs which are being invented for the treatment of different diseases. Names of organisms, enzymes are just few examples of medical neologisms (Yaseen op.cit.27).

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[8] Achilles tendon: the strong tendon joining the muscles in the calf of the leg to the bone of the heel—called also tendon of Achilles; compare hamstring.

[9] Crohn's disease causes inflammation of the digestive system. It is one of a group of diseases called inflammatory ... small intestine called the ileum. National Library of Medicine

[10] Cushing syndrome: Cushing syndrome is a disorder that occurs when your body has a high level of the hormone cortisol. Ferri F.F. (2016: 385-386).

6. Blends: Blends are the new words that are formed from parts of other words. The blending process means joining the first part of a word with the final part of another word to eventually create one word (Farghal, 2000:45). One example of medical English blends is the word ‒caplet‖ which is taken from the two words ‒capsule‖ and ‒tablet‖ to refer to some kind of pills that is between capsules and tablets (Yaseen op.cit.27)..

7. LGP Terms vs. LSP Terms: Within the field of English medicine, two types of language are differentiated by terminologists in relation to terms as LGP (language for general purposes) and LSP (Language for special purposes). LGP terms are everyday words that are non-technical and accessible to everyone, and nonspecial medical knowledge is needed to understand them, e.g. chest, kidneyfailure, stroke,…etc. LSP bound terms, on the other hand, are the technical specialized terms that are not readily accessible to non-professionals. Terms as thorax, renal failure, cerebrovascular accident are the corresponding technical terms for the above mentioned LGP terms respectively (Wiseman, 2000).

3.5.1.3. Syntactic Features of English Medical Texts

At the sentence level, medical English is structurally complex. Medical English shares many features with the language of science, in general. These features are as follows:

1. Reduced Relative Clauses: A relative clause is a type of subordinate clause introduced by a relative pronoun; example: ‒What is the name of that boy who just walked in?‖ Here the clause ‒who just walked in‖ is an example of a relative. A participle can often be used instead of a relative pronoun and full verb; example: "The girl **sitting** next to Peter is my neighbor‘s daughter‖. Relative clauses are usually reduced in medical English as in the following example: "This phenomenon can be explained by the description of special

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pathways in the artial wall, having a structure consisting of a mixture of Purkinje fibers and ordinary cardiac muscle cells" [11] ,instead of " which has, that consists of…‖

2. Prolonged Strings of Successive Adjectives: One prominent feature of medical English is the use of more than one adjective simultaneously for defining or describing one entity. [12]Examples are: left anterior descending (interventricular) coronary artery, fourth posterior sacral foramen, etc.2

3. The Use of the Present Tense: according to Haddad, (1997:9) the use of the present tense is an obvious feature of medical English as well as in the language of science. Examples are many including: each intercostal nerve enters…, cardiac muscle consists of…etc.

4. Complex Structure: Medical English employs many structures that, although they might not be so much problematic to English doctors, on some occasions, they form an obstacle to medical practitioners whose first language is not English despite their impressive command of it. This observation, made by an Arab doctor, depends for its validity on specific [13]examples as: –…**the greater petrosal nerve**. This nerve joins the deep petrosal nerve as it passes through the foramen lace-rum to form the nerve which passes anteriorly through this canal to the pterygoplalatinefossa3‖.It is not structurally clear whether the anaphora –it‖ refers to ─the greater petrosal nerve‖ or to ‖the deep petrosal nerve‖.

5. Prepositional Phrases: Prepositions and prepositional phrases play a significant role in the professional medical language in English. The preposition –of‖ has the highest

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[11] Example taken from سُّل علم النثرُّ السرُّي الصذر واظهر عربُ – أُجلِ زيُّ p. 147.

[12] Examples are taken from p.185, 248.

[13] Examples are taken from *Clinically Oriented Anatomy*, Sixth Edition, p.952. 29

frequency compared with other prepositions, though this finding cannot be generalized as a universal rule (Krulj et al: 173).

6. Progressive Stripping of Compound Nouns: In special-language texts in general such progressive sequences are frequently occurring (Rogers, 1997: 220). Medical English is full of compound nouns (Newmark, 1979: 1406). An exemplification is as follows: ‒Disease Control measure‖ instead of ‒measures for the control of diseases‖.

3.6. The Development of the Arabic Medical Language

Arabic medicine reached its highest development during the Islamic era, more specifically during the Umayyad and Abbasside periods, when movements of translation into Arabic flourished, followed by a period of Arabic contributions. The history of Arabic medicine extended from the eighth century when Arab intellectualists started to appear and multiple sciences began to emerge eastward. This inspiration of sciences remained there until the beginning of the thirteenth century (Najjar, 2012: 587). While the Middle Ages were an era of darkness for Europe, for Arabs, they were an era enlightened by a renaissance of scientific study which preserved for the world much of the medical knowledge of the Greeks and ancient Semites and added on it by contributing with much of what had been unknown in medical science (Wakim, 1944: 96). The history of Arabic medicine can be divided into three main stages; the age of translation, the age of Arabic original contribution, and the age of decline and transmission to Europe (Sa'di, 1958: 208-218). The next few pages present an outline for the three stages. It also sheds some light on the aftermath establishment of Arab academies and their role in developing medical Arabic.

3.6.1. The Period of Translation (A.D. 750-850)

Medical Arabic flourished and developed by means of translating Greek and Latin medicine into Arabic. Haddad (1997, 29:30) has explained that such translation movements began in the Islamic era during the Umayyad period. Translation was further developed during the Abbasside era as Abbasside Caliphs had great interest in science and knowledge and the translation of scientific works. Indeed, doctors and scientists, in general, were encouraged and were offered incentives, help and support in return of their efforts in translating Greek sciences. For example, Caliph al Mamoun used to pay translators of Greek and Hippocratic works the weight of their translations in gold (Najjar, 2010: 588). The most prominent translator who had translated the whole Galenic corpus was Hunain bin Ishak (Romani, n.d.: 100). His widespread popularity stems from the fact that, until Hunain's time, Arabic scientific knowledge was insufficient in content and lacked terminology which makes the most essential feature of scientific knowledge and communication. Hunain was in a position to develop Arabic terminology for practically every branch of knowledge (Sa'di, 1958:208). Pormann (2011: 493) has pointed out that the evolution of pharmacological writing in Arabic started in late eighth century in which technical terms were developed and translated into Arabic by means of transliterations until mid-ninth century in which many standard Arabic translations of Greek words were established. Hence, it is worth noting that medical Arabic at that time and along the Middle Ages followed two methods in its translations of scientific and medical works. Haddad (1997: 32- 33) has explained that the first method of translation was Yunnan bin Batriq's method (a word for word translation) in which he looked at every Greek word and tried to find a corresponding and equivalent Arabic word. This method was deemed ineffective due to the lack of one to one correspondence between Greek and Arabic and due to the big linguistic gap that exists between Greek and Arabic. The second method of translation was that of Hunain bin Ishak (translating meaning)

in which he translated sentence by sentence rather than word by word. He translated sentences into corresponding sentences in terms of meaning regardless of whether or not they were equal at the word level. This translation method was deemed better than Yunnan bin Batriq's method as it avoided the inadequacies of the previous method of translation (ibid.). Thus, Arabic scholars preserved the scientific heritage of other nations and assured the spread of scientific knowledge trough translations. This fact highlights the importance of translation in building civilizations and in bridging civilizational gaps Yaseen (op.cit.33).

Following the stage of translation comes a more fundamental stage characterized by the beginning of originally Arabic medical writings alongside continuing the translation from classical languages into Arabic.

3.6.2. The Period of Arabic Contribution (900-1100 A.D.)

In this period, the Arabs saw many great advances in sciences as they gathered knowledge fom Greeks and added their own finding. The Arabs began to build on and develop classic sciences, and relied upon their own resources, scientific experiments and discoveries. This stage of Arabic-Islamic medicine was known as ‒the Golden age‖ and was characterized by the production of what are defined as medical encyclopedias due to their comprehensive content Mouazzam (1989:8). The most famous medical figures were Al-Razi, Ibn Sina, and Ibn Al-Haitham. Together with Al-Magusi, who were considered as "the most important protagonists in the process of ‒vivification of medical sciences" Romani (2007:101). Najjar (2010: 587) has also described this idea by quoting Osler as: ‒The Arab scholars had used the Greek candles for their lamps, but they rapidly became huge Flambeaus that gives its light to all world‖. Some of the Western scholars see the contributions of the doctors of the Arabic and Islamic world as simple keepers of Greek science to the scholars of the Renaissance. According to them, the contribution of Arab Scholars including physicians is

mainly related to the preservation of Greek knowledge and its transmission to the West Minhaj (2016:455).

This pejorative point of view conceals the tremendous contribution of Arab doctors to medical sciences. Minhaj (ibid.460) considers that Arabic medicine contributed a lot in the advancement of medical science in the West. It is much more important than what does the West recognise. As Najjar (2010:289) has argued, it was Ibn al-Nafis who first described **"the pulmonary circulation".** This discovery refuted the thousand-year old theory of Galen that had suggested invisible pores in the intraventricular septum. The Arab achievements in this stage have largely laid the basis for Western medicine to flourish afterwards.

3.6.3. The Period of Decline and Transmission to Europe (1100-1400 A.D.)

The study of science started to decline in the East at the beginning of the twelfth century, hence marking the end of the Eastern intellectual era and at the same time drawing the beginning of scientific growth in the West (Haddad, 1997: 31**)**. By the end of the thirteenth century, sciences were transmitted to Europe. As the Arab civilization had expanded and reached Spain, western students came in contact with the Arabic scientific heritage. For example, a man named Gerard of Crimona, learned Arabic and translated 92 books into Latin (ibid.). Similar efforts granted the rest of Europe a wide access to the Arab rich civilization, ultimately paving the way for further studies and discoveries which characterized the Renaissance era in the Western world. This, at the same time, resulted in a period of scientific recession in the Arab world where medical Arabic has occupied a back seat compared to the Western medical languages. Nonetheless, in the nineteenth century, movements to revitalize scientific terminology started throughout the Arab world not through original Arabic contributions to medical sciences, but by means of translation once again. Translation of medicine started over in Muhammad Ali's reign (Al-Zarkan, 1998**)**. Schools of

translation then started to appear in Syria, Iraq and other spots of the Arab world. The translations were notably from French into Arabic. However, when the American University of Beirut was set up, sciences from English started to slash their way into the Arab world through translation (Haddad, 1997: 32).Since that time, the Arabic language that was once a means of civilizations bridging and a source language from which other languages sought credible amounts of translation, has now become a target language that struggles to keep up with everyday updating foreign sciences. One step toward achieving approximation to the western advanced medical sciences is the establishment of institutions accountable for translating western medical publications and, in many cases, creating new Arabic medical terms to correspond to the constantly emerging English medical terms. These institutions are represented by the Arab academies which began to emerge after the First World War (Al-Zarkan, 1998).

3.6.4. The Arab Academies and Institutions of Standardization

3.6.4.1. The Arab Academies

According to a July 24, 1995 article in the *US News and World Report*, almost 25.000 new English words are coined every year, of which only 4% make it into the dictionaries (Segura, 1999). Consequently, Arabic for science, in general, is today somewhat behind the times with respect to the plethora of English terminology being created every day. The Arab academies were institutions established to serve Arabic Language, preserve it, and make it adequate for accommodating all the requirements of science and arts to fit more the needs of contemporary life. Al-Zarkan (1998) has thoroughly studied the Arab academies and their efforts in this field, and to him, the present review is accredited. There are four Arab academies that have been mainly at work in Syria, Iraq, Jordan, and Egypt. The first Arab Academy was established in Syria in 1919, followed by the Arab Academy in Egypt in 1932,

the Iraqi Scientific Academy in 1947, and finally the Arab Academy in Jordan which was founded in 1976. At the beginning, especially in the Syrian and Egyptian Academies, no due heed was paid to technical terms in spite of their importance and necessity in the world of rapid discoveries and invention. This, in fact, hindered medical Arabic to some extent. However, these Academies, eventually, took the initiative in introducing thousands of Arabic technical terms, and they opened the door toward further advances in this field. The methodologies all the Arab Academies have followed in translating medical terms in particular have been similar to a large extent. The Arab Academy in Damascus, despite its small contributions, derives its importance from being the first step toward reviving Arabic technical terminology. But, the Academy does not have any specific procedures in arabizing terminology, according to its previous president Dr. Husni Sabah, a professor of Medicine (Sieny, 1985: 155). Hence, the work of this Academy was based on the efforts of its individual members (Al-Zarkan, 1998). As a result of such individual works, medical Arabic terms suffered from multiplicity; thus creating a substantial degree of confusion among translators. However, since the Arab Academy in Cairo has contributed most to the process of translating and coining of Arabic technical terms, the researcher finds it suffice to present its methodology to stand for all other Arab academies in their efforts to develop medical Arabic.

3.6.4.2. The Methodology of the Arab Academy

The Arab Academy is said to have followed the traditional methods of coining terms through transliteration, blending, derivation, and arabization. Its methodology can be summarized as follows: In case there are Arabic equivalences for the scientific foreign terms, the Arab Academy follows the following steps:

1. Reviving equivalent terms from ancient Arabic books.

2. Creating Arabic dictionaries in which these old Arabic terms areincluded.

3. Preferring old terms over new ones unless the new ones are common.

4. Avoiding multiplicity in reference in that each term refers to one meaning only.

Moreover, in case the terms are new and have no equivalence in old Arabic books, Sieny, (1985: 156) stated: ‖the Cairo Academy has very sophisticated procedures in processing new terms beginning from subject specialties through to the annual ‗General Conference', when the new terms are given the blessings of the Academy‖. Al-Zarkan (1998) specifies these procedures as follows:

1. Asking the experts to provide thorough explanations of the new terms.

2. The terms are, then, discussed by committees within the Academy, and the equivalent terms are reviewed by the council of the Academy.

3. If the council approves the terms, they are spread in the scientific fields by sending lists of the latest coined terms to educational institutions. In an attempt to stay updated with the latest sciences and scientific terms, the Arab Academy asks educational institutions to send to it lists of the newly used terms and their foreign equivalents, and discusses the possibility of including them in Arabic dictionaries. If the terms are approved, the Arab Academy recommends the use of such terms. Furthermore, the Arab Academy would also include the terms that have been used in other Arab countries. This, once again, has led to lack of standardization of the scientific terms among Arab countries. Like other Arab academies, the Egyptian Arab Academy looks at transliteration as the last resort. In other words, it tends to transliterate terms if and only if finding an equivalence of purely Arabic origins is out of question. Thus, it tends to transliterate, for example, proper names and names of chemical elements like Oxygen, Hydrogen,..etc. However, transliteration is not arbitrary

but is rather rule governed as it should follow certain rules in transferring foreign letters into Arabic ones. For example, the pronunciation of such transliterated terms should comply with the Arabic rules. Furthermore, the Academy allows for the use of foreign words as they are when necessity calls for that, though it does not define what that necessity is or to what extent foreign words can be used in Arabic. Moreover, it does not recommend translating a term with a phrase or with more than one synonymous term. It stipulates that the Arabic term be clear and precise in its meaning. Finally, the Egyptian Arab Academy seeks to avoid strange terms, though it does not deny the use of some rare terms that seem quite sound.

To conclude, it can be noticed that despite the relative differences that characterize the Arab academies, all have agreed upon similar methodology in their attempts to deal with the scientific terms. They all called for reviving the old Arabic terms as a first step rather than the tendency to hastily create new ones or even transliterate the foreign terms **(Al-Zarkan, 1998)**. In relation to medical terms, in particular, it can be said that both the Egyptian Arab Academy and the medical school at the Syrian University are the most active groups in enriching medical Arabic.

3.6.4.3. Other Institutions

Along with the Arab academies, there are also other institutions that are concerned with translating and arabizing scientific terminology. Sieny (1985:156) has listed them:

1. ALECSO's Bureau of the Coordination of Arabization in the Arab world. The Bureau is largely involved in the coinage of new terminology in addition to its main role as a coordination agency.

2. The Institute for Studies and Research for arabization.

3. The Kuwait Research Institute.

4. The Arab Development Institute in Tripoli and Beirut.

Thus, many bodies have been concerned with the production of Arabic technical terms in general and medical terms in particular. Consequently, the need for establishing medical dictionaries to include the thousands of the arabized, newly coined, or transliterated terms to serve as translational equivalents to the increasing numbers of foreign medical terms is extremely urgent. The next section presents the most common resources for medical Arabic.

3.6.4.4. Resources for Medical Arabic

Contemporary medical Arabic is said to be heavily dependent on translating English medicine; therefore, the need for a reliable translation references is crucial. According to Romani (2007: 95), there are two standard dictionaries and two internet-based resources that count as main references for Arabic medical terminology. The first dictionary is the Unified Medical Dictionary or UMD. It is issued and sponsored by the Regional Office for the Eastern Mediterranean of the World Health Organization, and it is thus considered of an official status. The second dictionary is the Arabic Dictionary by Yusuf Hitti. Although it is of a lesser official status compared with UMD, it is considered a rich reference for medical practice in the Middle East. Additionally, the two internet-based resources are Arabic Wikipedia and the Arabic medical website, Altibbi.com. The latter is more reliable given the fact that it is a very well managed website, and it includes extended descriptions that make it as a sort of an online Arabic medical encyclopedia. Arabic Wikipedia, on the other hand, includes contributions that are made in an anonymous way without a strong standard of reference. However, Arabic Wikipedia derives its importance from being perhaps the closest reference possible to the current medical and linguistic practice.

3.6.4.5. Criticisms to the Arabization Efforts

According to Al-Zarkan, (1998) despite the immense efforts the Arab academies have paid in the field of medical terminology, they could not manage to unify and spread the approved medical terms throughout the Arab world .

Arabic medical terms suffer heavily from multiplicity in reference. Additionally, some of these different translations of the same English medical term are contradictory in meaning. This idea is best illustrated by Al Zarkan through the example below.

The English medical term UMD translation Hitti's translation

Epiphysis (p. epiphyses) " كردوس, مشاشَة الولشاش "ج: الوشاش

Diaphysis شاشه, ساق وأ عوذ العظم جذل

As it can be seen from the example above, there is some overlap between the translation of the two most credible Arabic dictionaries, the UMD and Hitti. The word –الوشاش – is used by the UMD to refer to the plural form of epiphysis– where – جǁ stands for –جوع ǁ- and at the same time, it is used by Hitti to refer to a different part of the bone i.e. the diaphysis. ‒Epiphysisǁ refers to ‒the end of a long boneǁ while ‒Diaphysisǁ refers to ‒the shaft of a long boneǁ. Moreover, Arabic medical dictionaries include words that are odd and unfamiliar (Haddad, 1997: 7). Another weak point is the inconsistency of the lexical choices they make. This idea is expressed by Romani (n.d.: 95) as follows:

> *One could think that contemporary technical medical lexicon isalready covered by dictionaries and other reference works: in fact it is not so. Although contemporary medical dictionaries do indeedexist, they tend – as in other sectors of contemporary Arabian lexicography – to normalize terminology according to [the] guidelines of language academies rather than on common medical terminological praxis. Moreover, as it is customary in Arabic lexicography, medical dictionaries often do not agree in their lexical choices.*

Consequently, translators tend to make different lexical choices and use different equivalences for a single foreign medical term leading, eventually, to terminological inconsistency. Haddad (1997: 36) argues that medical terms are usually translated by resorting to medical dictionaries to find equivalent terms. Having found such terms, Arab linguists approve them as a formal translation without due consideration to clarity, familiarity, and precision. Yet, another weak point attached to Arabic medical dictionaries – most probably Hitti rather than UMD- is the fact that different terms with different conceptual references may be translated by one term only leading to what is called –lexical over standardization‖ which refers to the total or partial equation of two or more different SL terms with one TL correspondent (Nassar, 2002: 50). For example the term –aponeurosis‖ is defined by (Merriam Webster Online medical Dictionary 2009) as –any of the broad flat sheets of dense fibrous collagenous connective tissues that cover, invest, and form the terminations and attachments of various muscles‖ and the term –peritoneum‖ refers to –the smooth transparent serous membrane that lines the cavity of the abdomen of a mammal, is folded inward over the abdominal and pelvic viscera, and consists of an outer layer closely adherent to the walls of the abdomen and an inner layer that folds to invest the viscera‖. However, they are translated respectively by Hitti‘s dictionary (1982) as – الصفاق ‖, and – الصفاق,البريتوىن ‖. Thus, the word – الصفاق ‖ is used to refer to both aponeurosis and peritoneum. Furthermore, looking through any medical dictionary, one can find that at least two different meanings are provided for the same word. The English term is translated differently in different English- Arabic dictionaries; thus the translator feels confused about which term to use. Moreover, the lack of

standardization among Arabic medical dictionaries leads medical books translators to use different terms for the same concept which confuses students of medicine and affects their readiness toward studying medicine in Arabic. For example, the medical term ‒groin‖ is translated by the UMD as – اُربِة ‖ and as both – , اُربِة الوُغي ‖ by Hitti's dictionary. The term was translated in the book of as – الوُغي ‖ (p.142) while the same term is translated as " اُربِة " in the book of : نخيشُح الأعضبء وظهيُفبتهب يزرن الىُّعئىً الىبجح (p.447).

Thus, different Arabic words for the same English term are used in the translation of two medical books which aim to serve the needs of medical students whose first language is Arabic. Further, Al-Zarkan (1998) has pointed out that weak coordination between the Arab academies has resulted in such multiplicity of terms. Furthermore, the fact that Arab academies are colored with local characteristics makes their terminology not valid to be equally used in different parts of the Arab world. As a final note, it can be noticed that having different kinds of resources for medical Arabic and having different bodies of translation and standardization with low coordination among each other have caused medical Arabic to suffer from multiplicity in reference, over standarization, and a lack of standardization. All these, together with the superficial interest in issues of circulation and usability of translational equivalences have resulted in terminological inconsistency.

3.7. Medical Translation

Numerous translation strategies are available to translators and can be represented as follows:

1. *Word-for-word translation,* which directly replaces the word in the source language b by an equivalent word in the target language.

2. *Literal translation,* which adheres to the linguistic structure of the source language.

3. *Free translation* which is, primarily, interested in communicating the sense of the source text.

4. Modification which is used especially when dealing with two structurally different languages as English and Arabic.

5. Transposition when the order of words is being modified,

6. Paraphrasing which involves restatements in other form of words, etc.

All these strategies are essential at various times when dealing with various texts. Yet, scientific translation requires a particular attention especially when dealing with terminology which may be problematic to the Arabic target language. Medicine, for example, is a field of knowledge in the scientific and the technological development that each year incorporates a large number of new terms into the medical lexicon. Moreover, much time and effort are spent by individuals, organizations and language academes to find the Arabic equivalent names for products, concepts, and diseases. The processing of information in Arabic medical texts is currently a very difficult task. According to el Bouchikhi and Mustafa El Hadi (2009), who worked on semantic lexicon for indexing medical texts in Arabic language: ‒*The Medical terms in Arabic language are not following certain rules which facilitate their extractions (prefixes and suffixes), as is the case for the Latin terms. The word and terms do not allow splitting into morphemes*‖.

el Bouchikhi and Mustafa El Hadi go on arguing with the following example: The word **"electro/cardio/gram**[14]‖, translated into Arabic corresponds to the term   ‒ كهربية تخطط

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[14] Electrocardiogram: a graphic tracing showing the variations in electric force which trigger the contractions of the heart: it is used in the diagnosis of heart disease. *Webster's New World College Dictionary 2009*

الفق", includes three Arabic words that cannot be dissociated in order to preserve the meaning of the word.

Yet, Khadija el Bouchikhi and Widad Mustafa El Hadi noted that in physiology and surgery most terms have not been Arabized. They are rather translated from Latin into Arabic except the names of disciplines and the new words in the medical field. Thus, translation, transliteration and borrowing were used in the Arabic language in the medical field to enrich its lexicon and allow this language to follow the exponential evolution which the medical domain witnesses.

Also, in the translation process, some Latin terms find their equivalent in the Arabic language. An example given by Khadija el Bouchikhi and Widad Mustafa El Hadi is the word "stomach", whose Arabic equivalent is the word: **"المَعِدَة"**, while the transliteration process allows us to translate literally the Latin term given the absence of its corresponding word in Arabic like most terms in chemistry. An example is the word acetylcholine[15] which its Arabic transliteration is: **"أسِيتيلكولين"**. These are just a few generic examples of the complexity and depth of the Arabic language, which show how difficult can be the automatic processing and indexing of the medical terminology. As a result, the use of other methods of study is necessary to improve the information processing of Arabic specialized texts.

3.7.1. Approaches to Medical Translation

Many researchers have attempted to define equivalence in medical translation. Pilegaard (1997) explained that most of the current international medical literature adopts a sociolinguistic approach to medical language, i.e. describing it in terms of speakers and communicative situations, and that –the communicative purpose of medical language is to

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[15] Acetylcholine: A white crystalline derivative of choline that is involved in the transmission of nerve impulses in the body. *Webster's New World College Dictionary 2009*

provide unambiguous and non-synonymous language by means of terminologies in order to express relevant concepts, especially in the expert-to-expert tenor‖ (ibid.159-160). Hence, what must be followed in medical writing requires the same application on the translated copy. Medical translation, being a branch of specialized translation, follows the same patterns as any other type of technical translation. For instance, the translator of medicine should be adequately informed about the subject matter and should keep the maximum degree of accuracy. Also, medical texts are crammed with medical terminology that needs to be translated heedfully. Some theorists like Vinay and Drbelnet (1995:255) argue that translating technical terms can be easily handled by essentially consulting a bilingual or multilingual dictionary. Although accuracy can be maintained, using the right equivalence in the right context cannot always be granted. Newmark (1979: 1406) has pointed out that using such dictionaries can never be enough to reach the wanted equivalence as they often contain many synonyms that are out of context. From a translational point of view, equivalence is a very common concept in translation studies.

As far as the word level is concerned, Hatim (2001: 29) has illustrated that a quantitative approach to the scheme of equivalence relations can be adopted especially in domains of terminology and technical translation. (ibid.29) presents Kate's typology of a quantitative approach toward the concept of equivalence relations as follows:

1. **One-to-one equivalence***,* where there is a single expression in the TL for a single SL expression.

2. **One-to-many equivalence,** where more than one TL expression is available for a single SL expression.

3. **One-to-part-of-one equivalence,** when a TL expression that covers part of a concept is designated by a single SL expression.

4. **Nil equivalence,** when no TL expression exists for an SL expression.‖

The translation of English medical terms into Arabic is considered as an obvious case of one-to-many equivalence. It, generally, suffers from the absence of one-to-one equivalence. Roger (2008: 103) has quoted Catford: ‒In a text of any length, some specific SL [source language] items are almost certain to occur several times. At each occurrence there will be a specific TL [target language] textual equivalent.‖

Roger has explained that if a term A in the source text is always translated as term A' in the target text, this indicates a one-to-one equivalence of A and A' which can be represented without trouble in a bilingual dictionary. However, a probability of less than one entails variation in the lexical choices made by the translator in the target text for term A, and hence, a lack of consistency. He explains that, the case of one-to-part-of-one equivalence is manifested in medical translation into Arabic if taken from a medical point of view. For example, the English term ‒ataxia‖ is translated consistently as   حَرًث ‖. However,Nassar (2002: 36) denotes that this English term is defined as a ‒defective muscular coordination manifested when voluntary movements are attempted‖ while the Arabic term of ‒ حَرًث ‖ refers only to lack of balance in walking and excludes other voluntary motions of different organs of the body such as the head, the hand, etc. However, as long as terminological inconsistency is involved, medical Arabic seems to relate to medical English through   one-to-many   equivalence   relations.

3.7.2. Translation Procedures and Types of Equivalence

Yaseen (2013) noted that in translating medical English terms into Arabic, three main translation procedures that lead to three different types of equivalence are principally used as follows:

1. **Arabization:** According to Haloush, (2002: 21) Arabization means a lexical expansion that involves the rendering of new terms from existing roots and translation of foreign terms. For example the medical term **"[16]cataract"** is arabized as **"الساد".**(ibid.).

2. **Borrowing**: Molina, & Albir, (2002: 510) define borrowing as: ‒To take a word or expression straight from another language. It can be pure (without any change), or it can be naturalized (to fit the spelling rules in the TL)‖. Naturalized borrowing is also called transliteration‚. For example **"cataract"** is transliterated as. **"الكتاركت"** (ibid.).

3. **Description:** ‒To replace a term or expression with a description of its form or/and function‖ (ibid.2002: 510). For example, the same medical term of **"cataract"** is translated descriptively as **"العين تصاب بالعماء"**, or **"**عتمة بيضاء **"** (ibid.2002: 510). It is worth mentioning, here, that descriptive translation also includes the translation of one-word terms that consist of prefixes and suffixes and which are translated into two-or-more-words in Arabic. This takes place especially in Arabic which lacks the use of prefixes and suffixes in forming equivalents. This technique of word formation is used heavily in English especially in medicine. For example, the one-word term ‒pheochromocytoma‖ which is made up of (pheo=dusky), (chromo=color), (cyt=cell),(oma=tumor) is translated descriptively into Arabic as ‒القتامين ورم‖. Moreover, descriptive translation involves one-word equivalents that are seen to describe the form or the function of the original term. To illustrate, the term **"edema"** has been arabized as

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[16] Cataract : A medical condition in which the lens of the eye becomes progressively opaque, resulting in blurred vision.

– ‖ ورمة – or described as – ‖ السقاء‖. While – ‖ ورمة – is used specifically to stand for the term **"edema"** which means – an excessive accumulation of serous fluid in connective tissue or in a serious cavity‖ (Merriam Webster online medical dictionary 2009), the word – ‖ السقاء " is used to refer to any excess accumulation of fluid as in **"Hydrocephalus"** which involves –an excessive accumulation of fluid in the cerebral ventricle‖, and is translated as –‖الرأس استسقاء[17]. By the same token, the medical term **"allergy"** can be arabized as – ‖ أرجِية – or described as – ‖ حساسِية – since the latter translation refers to a common symptom that could be associated with different conditions not only –allergy‖.

Thus, the three types of terminological equivalence involve arabized, transliterated, and descriptive equivalences.

3.7.3. Terminological Inconsistency

Saraireh (2001) pointed out that standardization is one of the crucial procedures of technical translation, in general, for proper communication among the users of the TL text, and that consistency in translation is vital to maintain such standardization. According to Macklovitch (1995:1), terminological consistency means that –each terminological unit should receive the same translation throughout the final text, so that readers are not unduly confused‖ and that terminological consistency is, generally, accepted as being one property of a good translation. While variation at the word level is mostly considered a stylistic matter in literary texts, the non-functional variation in selecting terms in technical writing and translation results in inconsistency. Terminological inconsistency can, hence, be defined

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[17] Examples are taken from الطبية المصطلحات دليل, p.49.

negatively as the lack of consistency in the selection of terms or as assigning different translations to the same SL terms within a text or across relevant texts.

Al-Darawish (1983) stated four main difficulties in any translation:

    a) No two languages have exactly identical phonological, morphological, lexical, syntactic and semantic features.

    b) Languages differ in terms of sentence arrangement.

    c) A translator is forced to front or backward certain items.

    d) The impossibility for a translator to completely master two languages.

    However, Al-Hamdalla, (1998: 24) pointed out that this problem can be resolved through specialized scientific committees. A decade later, El-Zeini (1994) identified six main problems in translating from Arabic to English and vice versa: lexicon, morphology, syntax, textual differences, rhetorical differences, and pragmatic problems. Another decade later, Bahameed (2007) calls these difficulties as **"hindrances"** because they hinder translators from moving forward and stating in the same spot. He classifies these hindrances of Arabic-English translation into lexical, prosodic, structural, and cultural hindrances (ibid.).

3.7.4. Problems of Equivalence in Medical Translation

    Medical terms cause many problems in translating medical texts. The more medical terms appear in the source text, the more problems arise in translating the lexical items into the target text. In this situation, translators, usually, use bilingual medical dictionaries but these are often not updated in the target language and this, in turn, may affect the translation. So, a translator will think about the notion of equivalence which is one of the main features of translation study. Vinay and Dabelnet (cited in Cronin 2003: 121) describe equivalence as ‒the process of replacing elements in the ST with corresponding elements in the TT so as to

replicate the same situation as in the original whilst using completely different wording.‖. Similarly, Baker and Saldanha, (2009) define Equivalence as the relationship between two texts: a source text (ST) and a target text (TT). They consider that a translator's failure to achieve an appropriate equivalent translation can result in a mistranslation which may be misleading in most fields, but, which can be fatal in the field of medicine. Problems of equivalence occur at various levels, ranging from word level to textual level.

3.7.4.1. Grammatical Equivalence

Grammatical rules vary from one language into another. Each language has its own grammatical rules which may cause problems in terms of finding a direct correspondence in the target language. Baker (2011: 88) states: ‒*Grammar is the set of rules which determine the way in which units such as words and phrases can be combined in a language and the kind of information which has to be made regularly explicit in utterances.*"

In this respect, the information in a text should be organized and linked by grammatical rules in order to be understood, and a translator should be aware of these grammatical rules in both the SL and the TL. Having knowledge of the grammatical structures in the SL and in the TL is very important for the translator to be able to produce an accurate and reliable translation of medical texts. Baker (ibid.:88) argues that grammar is organized along with two main dimensions: morphology and syntax. Morphology covers the structure of words and the ways in which the form of a word changes to indicate specific contrasts in the grammatical system. Syntax covers the grammatical structure of groups, clauses and sentences. A translator should bear in mind the different aspects of grammar in the SL and in the TL. Baker (ibid.2011) goes on arguing that, unlike the Arabic grammatical system, the English system makes very few distinctions in terms of number, gender and verb agreement. For example, in English, there are few distinctions between masculine and feminine. Consider

the following examples: The word ‗patient' can be translated into Arabic as ضرُّه (masculine) or تضرُّه (feminine). The word ‗child' can be rendered into Arabic as طفلة (feminine) or طفل (masculine). So, the following sentence could be translated into Arabic in two ways, with regard to the word ‗patient': ‒The patient will need an operation within the next two weeks.‖ Can be translated as: يحتاجُ المريضُ الى عمليةٍ جراحيةٍ خلالَ الاسبوعينِ القادمينِ (masculine) Or as: تحتاجُ المريضةُ الى عمليةٍ جراحيةٍ خلالَ الاسبوعينِ القادمينِ (feminine) In this situation, if the context is not helpful for arriving at the correct choice, the translator may use both translations separated by a slash as: يحتاجُ المريضُ \ المريضةُ الى عمليةٍ جراحيةٍ خلالَ الاسبوعينِ القادمينِ English uses singular and plural forms, whereas Arabic uses singular, plural and dual forms which affect the form of the sentence. For example: The affected finger الاصبعُ المصابُ (singular) The affected fingers could be الاصبعانِ المصابانِ (dual) Or الاصابعُ المصابةُ (plural) The meaning depends on the context of the situation and any choice affects the use of other sentences' components such as verbs, adjectives, etc.

3.7.4.2. The Problem of Non-Equivalence

It is undeniably clear that all languages are different, and this difference makes it hard to find appropriate equivalents for some words or concepts in the target languages. An Arabic translator sometimes faces the problem of finding lexical equivalents for English words, objects and events in Arabic. Baker (2011: 23) states *"non-equivalence at word level means that the target language has no direct equivalents for a word which occurs in the source text.*‖ Many English words and concepts have no equivalents in Arabic and vice versa. Accordingly, He (ibid.23) identifies the common problems of non-equivalence which can be summarised as follows:

1. Culture-Specific Concepts: The source language word may express a concept which is totally unknown in the target culture. Culture is usually related to religious beliefs, social

customs, types of food or lifestyle. England, as a developed country, has many national institutions, organisations and services working in the medical field which are not found in Arabic countries. Thus, they do not exist in the Arabic language and it is hard to find their equivalents in Arabic. „**Adaptation services**", for example, refers to the services provided by a team, one of whose jobs is to check and assess if a house is suitable for disabled people and to provide the house with facilities to meet the disability. In Arabic, there is no equivalent for this concept.

 2. The Source-language Concept is Not Lexicalized in the Target Language: The source language word may express a concept which is known in the target culture but, simply not lexicalized, that is it is not _allocated' a target-language word to express it. Toothache is a pain in a tooth resulting from infection or trauma. Arabic has no equivalent for it, although it is a very common symptom. It could be rendered into Arabic by using the explanation _ الن ‏باألسنى و اللثة ‘ . Another example is **"Headache"** which is also a very common symptom. However, its translation into Arabic could be with the use of the explanation الن الرأس

3. The Source-Language Word is Semantically Complex: This is very common in translation. A single word which consists of a single morpheme can sometimes express a more complex set of meanings than a whole sentence. For example, „**dialysis**" (which is a Greek word *dialusis* meaning separating, dissolution, derived from *dialein*, *dia*-, apart + *lein*, to loosen) means _filtration to separate crystalloid from colloid substances in a solution by interposing a semi-permeable membrane between the solution and dialyzing fluid; the crystalloid (smaller) substances pass through the membrane into the dialyzing fluid on the other side, the colloids do not.' (*Stedman's Medical Dictionary*, 2006:532) This method is used for patients with kidney failure. Although dialysis is a very common process, in Arabic there is no equivalent for **"dialysis"** and it is usually transliterated as' دلزة '

4. The Source and Target Languages Mmake Different Ddistinctions in Meaning: The target language may make more or fewer distinctions in meaning than the source language. What one language regards as an important distinction in meaning another language may not perceive as relevant. In English, there is usually a difference between **"clinic", "surgery"** (GP) and an outpatients' department, but in Arabic there is usually no difference. All of these could be translated as عِيادة

5. The Target Language Lacks a Superordinate: The target language may have specific words (hyponyms), but, no general word (hyperonym) to head the semantic field. For example, _gonad' is a term used in English to refer to a gland that produces gametes and hormones: the ovary in the female and the testis in the male (Mostafa et al, 2007). In Arabic, there is no ready equivalent for gonad, however, 'مِبيض_ is used as an equivalent for ovary and _خِصية" for testis.

6. The Target Language Lacks a Specific Term (Hyponym): More commonly, languages tend to have general words (hyperonyms) but lack specific ones (hyponyms), since each language makes only those distinctions in meaning which seem relevant to its particular environment. For example, „**orthoptist**" and „**ophthalmologist**" are the names of eye specialists who do different jobs relating to eye treatments. In Arabic, there is no equivalent for each of these specific specialists. **Eye doctor** طَبِيبُ عَين, as a general expression, is used as an equivalent for both.

7. Differences in Expressive Meaning: There may be a target-language word which has the same propositional meaning as the source-language word, but it may have a different expressive meaning. The difference may be considerable or it may be subtle, but, important enough to pose a translation problem in a given context. For example, in English there is a

difference between **"snow"** and **"ice"**, but in Arabic there is no difference, „ثلج‟ is used as an equivalent for the words **"snow"** and **"ice".**

8. Differences in Form: There is often no equivalent in the target language for a particular form in the source text. Certain suffixes and prefixes which convey prepositional and other types of meaning in English often have no direct equivalents in other languages. Many English medical terms contain prefixes, roots or suffixes (as was discussed above) which carry meaning and have no equivalent in Arabic and, thus, are usually replaced by appropriate paraphrases. There are many examples in the medical field such as **"mitochondria"** in **"*mitochondria*l myoma"** is ‗the principle energy source of the cell' (Stedman's MedicalDictionary, 2006:1215) and **"myoma"** means weakness of the muscles, thus *mitochondria myoma* means weakness of the muscles due to deletion or duplication of the energy producer in the cell ‗mitochondria'.

9. The Use of Loan Words in the Source Text: The use of loan words in the source text poses a special problem in translation. Many medical terms are complex and hard to be understood by the English target reader, let alone by the target language reader, because they have been borrowed from other languages. Loan words can be found in all medical fields such as **canthus, capsulotomy, hypermetropia** and many more. Baker (2011) gives a clear example to explain the problem of loan words in the source language. She says that ‒**dilettante"** is a loan word in English, Russian and Japanese but Arabic has no equivalent loan word. This means that only the propositional meaning of ‒**dilettante**‖ can be rendered into Arabic. Its stylistic effect would almost certainly have to be sacrificed. To tackle the problem of non-equivalence, the translator should clearly understand the meaning of the word/words in the context of the source language before he/she starts the process of translation. Baker (2011: 25) remarks that different kinds of non-equivalence require different

strategies. She adds ‒… in addition to the nature of non-equivalence, the context and purpose of translation will often rule out some strategies and favour others‖. She (ibid.:51) illustrates some strategies used by professional translators for dealing with nonequivalence problems which can be summarized as follows:

1) Translation by a more general word (superordinate): This is one of the commonest strategies for dealing with many types of non-equivalence. This means using a general word instead of a specific word which has no equivalent in the target language. For instance, there are more than a hundred types of blood tests, the most common of which are: A complete blood count (CBC), Blood chemistry tests, Blood enzyme tests, Blood tests to assess heart disease risk and Blood clotting test. All of these can be rendered into Arabic as وﺪ ﺣﻣﻴﭗ which literally means ‒**blood test**‖ in English.

2) Translation by a more neutral /less expressive word: For example, the word ‗died' in this sentence: The patient died two hours ago can be translated into Arabic as ﯥﻓﻲ which is the equivalent for ‗passed away'. Although there is an equivalent for ‗died' in Arabic which is ‗ﻣﺎﺕ, the word ﯽﻧﺎﺣ” is more formal and often used when Arabs talk about human beings.

3) Translation by cultural substitution: This strategy involves replacing a culture-specific item or expression with a target-language item which does not have the same propositional meaning but is likely to have a similar impact on the target reader. For example, ‒**single mum**‖ cannot be translated into Arabic as ‗اﻭ ﻋﺰﺑﺎﺀ” as this expression does not exist in the Arabic culture. It can be rendered into Arabic as: ‗ﺷﺰﻋﻳ ﻏﻴﺭ زﻨﻄﻔﻣ اﻭ' Another example is the term ‒**midwife**” meaning a specialist nurse looking after pregnant women. In most Arab countries they do not provide this service for pregnant women. The term ‒**Midwife**” cannot be translated literally into Arabic. So, it is

rendered into Arabic as الداية or القابلة (see *Al- Mawrid Dictionary*, 2000: 578) which refers to a nurse who helps pregnant women at the time of delivering their baby.

4) Translation using a loan word or loan word plus explanation: This strategy is particularly common in dealing with culture-specific items, modern concepts and buzz words. For instance, **"decibel"** can be translated into Arabic as:

ديسبيل انسَي عبيئ وص حذة هـو

5) Translation by paraphrase using a related word: This strategy tends to be used when the concept expressed by the source item is lexicalized in the target language but in a different form. **"Decholesterolisation"**, for example, is rendered into Arabic as

.. الكنيخسينزول عشَ „

6) Translation by paraphrase using unrelated words: This strategy is used in some contexts if the concept in the source text is not lexicalized in the target language. For example, ‖ **myomatectomy"** can be translated into Arabic as: _العضني الخصيبل ورو "

7) Translation by omission: Translation by omission is to omit translating a word or expression [in some contexts]. If the meaning conveyed by a particular item or expression is not vital enough to the context of the text, the translator can simply omit [translating] the word or expression (Baker, 2011). For example, **"African tick-bite fever"** could be rendered into Arabic as _اللنفيزيتة انحمَّى" which literally means African fever, so the element tick-bite is not included in the translation but the translation is still regarded as correct. The translator should be very careful when deciding to omit a non-vital word and should never omit medical terms within the text.

8) Translating by illustration: Translation by illustration means giving an example or drawing a picture to show the meaning of the term. It is used if a word which lacks an equivalent in the target language refers to a physical entity which can be illustrated, particularly if there are restrictions on space and if the text has to remain short, concise

and to the point (Baker, 2011). This strategy is used in some bilingual medical dictionaries when there is no equivalent for the term and it is hard to explain; thus, illustration can be very useful. Most of the above common problems of non-equivalence mentioned by Baker (2011) are common in medical translation. These strategies are commonly used by translators but they should be very careful when using explanation and paraphrasing as medicine is a very sensitive subject.

In addition to the above mentioned problems of equivalence in medical translation, some terms are named after an inventor or the discoverer of a disease. For example, **Down"s syndrome**, named after the scientist who discovered the disease, can be translated as مُتلازمة داوُن. The name is kept as one cannot translate the names of people.

3.7.4.3. The Problem of Neologisms

Neologism means a new word or a new concept in a particular language. Neologisms were defined by Montalt and Gonzalez (2007) as new terms used to represent and transmit new concepts. They are the result of what is referred to as the process of **"terminologizing"** new medical knowledge. They can be either newly formed words or existing words to which new meanings are attached.

Neologisms can be considered as a problem in the source language as the author needs to coin a new word or expression. On the other hand, a translator also faces the problem of finding an equivalent for the new word or expression as they have not got ready equivalents in the TL, and they will not yet be available in dictionaries.

Accordingly, Montalt and Gonzalez (ibid.) argue that medical translators have two types of challenges. On the one hand, understanding the meaning of the English term in the source text and, on the other hand, finding an equivalent term in the target language. One of

the signs of the technological progress and development of any scientific activity is the emergence and development of a set of technical and scientific terms that represent the key ideas within that scientific activity and development. As rapid developments and progress in technology take place, especially in the medical field, new diseases are discovered and new medicines and equipment are invented. These need to be named in the source language and they also need equivalents for them to be formed in the target language. Thus, Montalt and Gonzalez (2007: 230) state: *"As new diseases appear and biomedical research advances, new knowledge is generated, which has to be conceptualized and transmitted. Thus, the purpose of terminologizing medical knowledge is to organize it, store it and make it available for communication."*

Neologisms are very common in medical terminology particularly for the names of diseases as they spread very quickly throughout the world and each language needs to have equivalents for them very quickly. In some cases functional-descriptive terms are used to name new diseases; for example, **"swine flu"** first became an epidemic in 2009. It started in Mexico and spread very quickly throughout the world. The disease mainly spread from pigs (swine) to humans. The affected people had similar symptoms to seasonal flu21 so it was easy to find an equivalent in Arabic for it using a literal translation. But, the problem is that the virus is new and it is named in the source language, which is English, as H1N1 which is a formula which has no equivalent in Arabic. In this case, the English word is adopted. Newmark (1988: 143) recommends some ways for dealing with neologisms. He states:‒Any kind of neologism should be recreated; if it is a derived word it should be replaced by the same or equivalent morphemes; if it is also phonaesthetic, it should be given phonemes producing an analogous sound‒effect.‖

When an Arabic translator of a medical text comes across a neologism in the source language, which is usually written in English, he/she has to look for an appropriate equivalent. If he /she cannot find any equivalent giving a definition will be the last solution.

3.7.4.4. Polysemy

Polysemy refers to a word with several different or closely related meanings. For example, **treatment, remedy, therapy** can be translated into Arabic as 'عِلاج. On the other hand, an English word could have more than one equivalent in Arabic; for example, the word [18]**mucus** can be translated into Arabic as: مُخَاط, صَنِين, قيح. Related to the difficulties of polysemy, the translator may face the problem of a word which has more than one meaning which are completely different in the SL and in the TL such as **"drug"** which can mean **"medicine"** or **"an illegal"** substance such as –**heroin",** and which can be translated into Arabic as دَواء" **"medicine"** or مُخَدِّر" **"illegal substance"**. In this situation, choosing an inappropriate equivalent in the TL can cause serious problems particularly in medicine. Here, the translator relies on the context of the situation and should be aware of what the translation is about. For instance: **The doctor advised his patient: "It is better to take this drug in time."** can be translated into Arabic as: „النَّصِيحَة في دَوَاء ل المُخَدِّر هذا أخْذُ ألأفْضَل مِن ويِ". In this sentence, the word „**drug**" was translated as „**illegal substance**". Thus, the first sentence is the appropriate translation which gives the equivalent of „**medicine**" for the term „**drug**". A translator should know that doctors never advise their patients to take illegal substances. The same principle applies when one translates the word **"pupil"** which can be rendered into Arabic as مُؤَنِي or حَدَقَة العَيْنِ. Also, the word patient can be translated into Arabic as "صَبِر or مَرِيض. Also, some acronyms and abbreviations can present a problem of polysemy, as they are not unique and some abbreviations or acronyms can have different meanings. Navarro (2005)

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[18] Mucus: a viscid slippery secretion that is usually rich in mucins and is produced by mucous membranes which it moistens and protects. https://www.merriam-webster.com/dictionary/mucus

claims that abbreviations and acronyms are sources of polysemy. According to him, the abbreviation **CF** can have at least 15 meanings: **calibration factor, cancer free, cardiac failure, chemotactic factor, Chiari-frommel, chick fibroblast, Christmas factor, citrovorum factor, clotting factor, colony factor, complement fixation, contractile force, coronary flow and cystic fibrosis**.

Nevertheless, polysemy can express the association of one word with one of its more distinct meanings. Mere dependence on the text is not sufficient. The context of the situation is very important in determining the appropriate equivalent for the term involved. In some cases, seeking advice from a consultant by a translator is the last option especially when one faces a problem of having more than one meaning for an English term, and they are all related to a similar subject matter. For example, **GP** has two different meanings in medicine. It can mean **General practitioner** or **General Psychiatrist.**

Conclusion

In a nutshell, we tried in this chapter to overview the notion the medical language and the medical translation. We attempted to cast some light on English medical terms, the derivations of English medical terms and the derivations of Arabic medical terms. We also tried to describe some problems of equivalence in the translation of medical texts including neologisms, non-equivalents and terminological inconsistencies.

Accordingly, it is clear that in spite of the great efforts that the Arab academies are exerting in the field of translating medical terms into Arabic, the approach followed in approving some translations is still rather prescriptive. Such translations are molded in linguistic carvings and, then, their use is imposed. Although following such an approach can, indeed, ensure an accurate rendering of foreign terms into Arabic, considering the target

audience to some extent can help maximizing the fruitfulness of such great efforts of Arabisation. Also, the movement of translation goes at a very low speed, giving thereby the room for the foreign terms to slash their way through Arab communities and gain familiarity much   faster   than   the   Arabic   ones.

CHAPTER FOUR:

The Importance of Reading Comprehension in Medical Translation

CHAPTER FOUR:

The Importance of Reading Comprehension in Translating Medical Texts

Introduction

Reading is one of the different skills that students should learn and care of. At university, students have always many different reading materials to read, such as: textbooks, articles and stories (etc...). Reading is more advantageous to students during their study because it enables them to acquire many things about the knowledge of language and help them understand different subject areas. Hence, reading plays a significant role in improving readers" language proficiency, especially in a foreign language setting. If the comprehension in reading failed, students would need to improve their comprehension. This is indicated in how reading strategies are so important and their aim is to facilitate not only the reading process for students but also to give them a clear view about what they are reading. Most of students at university have the ability to read; however, they always fail in the achievement of comprehension in reading, owing to the fact that they are unable to use certain effective reading strategies or lack of understanding of these strategies.

In this context, the present chapter shed some light on the importance of reading comprehension strategies in generating interferences that may help learners understand the medical source text and produce an effective translation of it. It starts with a definition of reading comprehension, then, it presents an overview of vocabulary development in students. It reviews some of the reading comprehension strategies. Finally, it highlights the impact of reading comprehension on translation practices.

4.1. Definition of Reading Comprehension

Reading comprehension is the ability to read text, process it, and understand its meaning. Wooley (2011) defines it as the process of making meaning from text. Its goal is to gain an overall understanding of what is described in the text rather than to obtain meaning from isolated words or sentences (ibid.). According to Seyed et al (2010:376-380), the word comprehension refers to "the ability to go beyond the words, to understand the ideas conveyed in the entire text". Furthermore, Snow (2002:11) sees that reading comprehension refers to "the simultaneous ability used by a reader to construct and extract meaning through interaction and involvement with written materials". A similar view is given by Maria (1990:14-15) who defines reading comprehension as "holistic process" of constructing meaning from written text through the interaction of (1) the knowledge reader brings to the text i.e. word recognition ability, word knowledge, and knowledge of linguistic conventions; (2) readers interpretation of the language that the writer used in constructing the text; and (3) the situation in which the text is read". Hence, reading comprehension is considered as a skill that is critical in the education and success of all individuals. Without adequate reading skills, students can struggle in many subject areas especially in the areas of translation where comprehension skills are significantly important. In the area of sciences especially in medicine, researchers indicate that many students lack prior knowledge and reading strategies to generate inferences; thus, students understand poorly scientific and medical texts. Many students lack the specific reading strategies to generate interferences that help in the understanding of scientific and medical texts. (Best, Rowe, Ozura, and Mc Namara, 2005). Berg, Gressman and Pfanz (1988) focus in their study called "*Improving Reading Comprehension through Vocabulary*" on the importance of vocabulary to improve reading comprehension.

4.2. Vocabulary Development in Students

There are important influences that lead to the development of vocabulary knowledge in students. As cited in Biemiller (2003), Hart and Risley reported that two major influences that affect the development of vocabulary are home influences and school influences. According to them, children of working class parents (who interact with their children as much as parents of advantaged families) have vocabulary level compared to those from advantaged families. Additionally, children who interact with adults develop a larger vocabulary than those who had limited contact. Carl Smith (2003:2) state: "most educators think of vocabulary as one skill thought in many different ways. However, there are many different levels of vocabulary proficiency that a student must work through" Four levels of vocabulary proficiency have been identified by Smith (ibid. :.2):

1. Listening vocabulary: words whose meaning are recognized when we hear them.
2. Reading vocabulary: Words whose meaning are recognized when we encounter them in our writing.
3. Writing vocabulary: Words we know well enough that we can use them in our writing.
4. Speaking vocabulary: Words we use in our speaking.

These levels tend to lead from one to the other in a progressive order, with listening being the lowest level and writing the highest level (ibid.2). As students attempt to increase their vocabulary, many different teaching methods are used. Yet, Smith (2003:3) identifies three factors that affect method of teaching vocabulary as active processing method: When students are doing something with a word more than just imitating the definition- they are more   likely   to   remember   about   that   word.

- ↗ Different contexts we can learn much about a word"s meaning through different contexts in which it is used. The more different contexts we encounter with that word, the more flexible we become with that word and its meaning and the more likely it is that we will remember it.

- ↗ Using several techniques for reviewing that word instead of only one. i.e., as learners acquire vocabulary more readily through encountering words in different contexts, different kinds of review activities apparently enhance vocabulary development. Each review activity reveals a word and its meaning in a different way, offering its own perspective on the word and its meaning (ibid.2-3).

Albert and Foil (2003:1) Identified in their article "*Drama Activities that Promote and Extend your Students"* ideas to help students learn and practise vocabulary. According to them (ibid:1): " Using drama activities to teach target vocabulary words can be an effective and motivating instructional practice for all students, especially those with learning problems". There are many ways to teach and practice vocabulary. The role of the teacher is to identify research base methods and determine the most adequate method to be thought to students and practiced in class. Any of these methods can be used on an individual basis or with partners or groups. Brown (2003:49) pointed out that: "The premise-one teaching and learning approach fits all- is not working for a growing number of students" populations. Twenty first classroom challenge traditional teacher-centered curriculum to meet the increasingly diverse needs of students, and make the required increases in achievement gains".

Accordingly, Brown (ibid: 49) states that the characteristics of the teacher-centered approach are associated primarily with the transmission of knowledge. Teachers are

"pressured to meet accountability standards", and often sacrifice the needs of students to guarantee exposure to the standards. Another characteristic of a teacher centered approach is to focus on content more than on the student processing. Teachers focus on creating relationships with students that are fixed in intellectual explorations of selected material. Hence, the control of learning is basically held in the hands of the teacher where he uses personal knowledge to help the learners make connections.

Hence, different teaching strategies can be implemented to develop the necessary vocabulary that will generate interference and will help to develop reading comprehension skills. This latter will improve the students" understanding of the source medical text and will help to create an effective translation of it.

4.3. Reading Comprehension Strategies

In the area of reading strategies studies, many researchers employs different types of strategies; these last stands effective, useful and beneficial for students understanding which some of them are as follows: predicting, skimming, scanning, inferring, guessing the meaning of new words, self-monitoring, and summarizing.

4.3.1. Predicting

Magliano (1993: 35-53) stated that "prediction strategy involves thinking about what might be coming next in the text. It is applied by effective reader that means, they used pictures, headings and text as well as personal experience to make predictions before they begin to read". So, predicting involves thinking ahead while reading and anticipating information and events in the text. Hence, Predicting helps learners to think about the information based upon the text, the author, and background knowledge; in other words, "it makes students elicit their interest, activate their prior knowledge, or pre-teach vocabulary or

concepts that may be difficult" (Jessica, 2000 cited in The Ohio University Education, 2014). In addition, predicting requires learners to use the text to decide what will happen next. Readers confirm or deny predictions with support from the text (Test Wise Word Assiciation, 2006).

4.3.2. Skimming Texts

Scanning and skimming are two specific speed-reading comprehension strategies, which enable the students to cover a huge amount of material very rapidly and build knowledge about the text. These strategies may help students improve their understanding of the source text and produce an effective translation of medical texts, since medical translation which is considered as one of the prominent area in translation .These techniques of reading comprehension are similar in process but different in purpose. They require specific steps to be followed.

According to Grellet (1999: 2-25) skimming is used by readers to get "a general idea about the content of printed materials through reading the text quickly i.e. in this strategy, readers will look for something quite specific or get general ideas before putting effort into close reading". Skimming helps students locate the information quickly while making sure they use their time wisely. It also increases the amount of usable material they obtain for their research. Indeed, there are different techniques to skim a text: 1. Use of quick glance through the pages. 2. Notice the titles and headings and subheadings. 3. Read the opening sentence and the conclusion carefully. 4. Read the first and the last sentence of each paragraph in order to gain the main idea of the main points (As Dinah Mack & Holly Epstein Ojalov, 2009 cited in The article of New York Times (2014).

Skimming a text is useful in three different situations:

- Pre-reading-skimming is more than simple reviewing. It can give a more accurate picture of the text to be read.

- Reviewing skimming is useful for reviewing a text already read.

- Reading skimming is often used for a quickly reading material.

4.3.3. Scanning Texts

Scanning a text rapidly covers a great deal of material in order to locate a specific fact or piece of information. According to Grellet (1981:58-59), "scanning is a reading technique that requires reader to search for specific information without reading the whole text, through looking at its title, table of content and so on". Scanning can be very useful in finding specific names, dates, statistics or facts without reading the whole text.

4.3.4. Inferring

In reading comprehension research, inference processes and the role of prior knowledge in these processes are viewed as central issues in the comprehension of texts Mc Namara (2011:35). Indeed, the ability to draw inferences is central to reading comprehension across the lifespan (Oakhill, Cain, & Bryant, 2003; Paris, Lindauer, & Cox, 1977; van den Broek, 1990), and there is direct evidence that it is not just a by-product of comprehension, but rather a plausible cause (Cain & Oakhill,1999). According to Prezler (2006:4) "inferences are evidence -based guesses i.e. in case of reading; students use their prior knowledge to make inferences about the text". Similarly, Zimmermann (2009:23) noted that inferences are often referred to as what you "read between the lines" that means the author wants the reader to make the jump to the same conclusion the author has made. He states that "Drawing inferences from text is a technique which requires readers to use their prior knowledge (schema) and textual information to draw conclusions, make critical judgments, and form

unique interpretations from text" (ibid.23) .So, the inferences are the conclusions that a reader draws about the unsaid passage based on what is actually said by the author.

(Cook, Limber, & O"Brien, 2001) identify two types of interference: One type of inference, called "Dridging Inferences", connects current text information to information that was previously encountered in the text, such as connecting the current sentence to a previous sentence. Another type of inference called, "Associative" "Inferences" or "Elaborations", that connects current text information to knowledge that is not in the text.

4.3.5. Guessing the Meaning of New Words

Guessing the meaning of new words is one of the most difficult problems that may face students in the comprehension of texts. This difficulty is closely related to new and unfamiliar words for which it is clearly difficult to infer meaning. According to Clarck (1980:211-220) the best way to solve this problem is "to guess the meaning of unfamiliar words from the context in order to save time and to continue reading without interruption or referring to a dictionary". The ability to guess meaning from context is a useful skill to practice and try to improve. There are many things that could help students such as: (1) Guess the meaning of the text which surrounds it (2) the way the word is formed (3) background knowledge of the students about the subject E.O.I. de Sabinaningo organization , (1993).

4.3.6. Self-Monitoring

Hanson (1996:173-191) views that the ability of a student to self-monitor his or her performance is a natural step to become independent in reading and understanding a text, which can take place only when students take responsibility for their own behavior and become essentially what is called as "agents of change". Furthermore, Carr, Punzo, Rutherford, Quinn & Mathur, (1993: 50-241) believe that self-monitoring can be used both to

assess where students are functioning academically and behaviorally and to improve academic or behavioral performance.

4.3.7. Summarizing

Summarizing is the last strategy that can be used by readers, it requires the readers to organize, restate the information or the main ideas of a given text by using the reader‟s personal style after the comprehension of the text. In other words, summarizing is taking a lot of information and creating a condensed version that covers only the main points. Oxford (2006:717) defines summarizing "as a short description of the main ideas or points of something without any details" Similarly, Reading Rockets Organization (2014) puts: "Summarizing teaches students how to discern the most important ideas in a text, how to ignore irrelevant information, and how to integrate the central ideas in a meaningful way. Teaching students to summarize improves their cognitive ability about what is read."

4.4. The Impact of Reading Comprehension and Translation Practises

Comprehension is a process in which readers filter understanding throughout motivation, knowledge, cognitive abilities and experiences. Tankersley (2003:108) views Effective readers as readers, who have a purpose for reading, and use their background knowledge and experiences to relate to the text. According to him (ibid.) readers do not comprehend unless they draw connections between what they read and their background knowledge. Furthermore, Pang et al (2003) described reading comprehension as an active process a reader made to construct meaning from a text. This process consists of using an interaction between a prior knowledge, and drawing inferences from the different words and expressions the writer uses, in order to understand information, ideas and viewpoints. Smith

(1985) also believes that reading comprehension involves bringing a prior knowledge interacted with what s/he is reading, so that s/he can achieve comprehension.

Reading comprehension is, hence, operationally defined as "a task to improvement what the student is reading as demonstrated by correct responses on questions about the text and grammatical points in the related book. Journal of Studies in Education.

4.4.1. Learners' Grammar Achievement

Grammar is an essential element in any language. It is the structural foundation of ability to express oneself correctly and transmit the message effectively. The more one is aware of how it works, the more one can monitor the meaning and effectiveness of the way one and others use language. It can help raise precision, detect ambiguity, and exploit the richness of expression available in English. And "it can help everyone-not only teachers of English, but teachers of anything, for all teaching are ultimately a matter of getting to grips with meaning". *Crystal (*2004)*,*

Accordingly, David Taylor (1995) claims:

> *Just as a pedagogical grammar can be regarded as a description of the grammar of a language made for teaching and learning purposes, to help in the teaching and learning of that language, so pedagogical phonetics and phonology can be regarded as a description of the sound system and pronunciation of a language for the purpose of allowing teachers to teach it more effectively and learners to learn it more effectively. The point about pedagogical grammars is that they are not the same as linguistic grammars because they have different functions and uses.*

Nagyné (2006) remarks that: "*Drawing on work in several fields such as linguistics, psychology and second language acquisition theory, pedagogical grammar is of a hybrid nature, which usually denotes grammatical analysis and instruction designed for the needs of second language students*" In its extended view, it involves decision making processes on

behalf of the teacher which requires careful and time-consuming interdisciplinary work. This process is influenced by the teachers" cognition, beliefs, assumptions, and attitudes about the teaching of grammar. Nagyné (ibid.)

4.4.2. Translation Practise

Ross (2000: 61–66) states that translation is recognized as the fifth and the most important social skill since it promotes communication and understanding. As a form of communication, translation involves interaction and cooperation between people, which makes it a very useful tool in foreign language teaching.

According to Deignan, (1997), Szabo, (1996), Lazar, (1996) Translating from L2 into L1 seems to be natural; yet, they consider translating from L1 inti L2 as a much more complicated task that requires talent and mastery of both the source and the target languages. They consider that translation is a serious business which requires careful preparation both on the part of the teacher and the learner (ibid.). Distributing a text to students to translate is not a very good methodology of teaching translation. Carefully graded preparatory activities are necessary, and they can be integrated in reading, listening and writing activities, and also in vocabulary and grammar practice (ibid.). Since translation is time consuming, it is advisable that longer pieces should be done at home. Occasionally, separate classes can be devoted to translation, but only with a highly motivated class. The teacher should ensure that these tasks are done as pair or group work. The purpose of this is to give the learners a chance to discuss, test and compare their ideas. (Harmer,1991: 162, Ellis, 1992: 49, Nunan, Lamb, 1996: 99).

The purpose of translation in the language classroom is not to train professionals, but to help learners develop their knowledge of English. In other words, it is a means to an end, not an end to be achieved. However, Friedlander, (1990:110) note that some learners may

become translators one day, and the basic knowledge of translation that they have gained in the classroom can serve as a solid ground for building up translation skills. He (ibid) goes on arguing that translation in foreign language classes is in the process of becoming a form of "pedagogical translation", which is no longer considered as an ineffective tool in language learning and is assessed as a way to enrich learners" competences.

Students taught by using pedagogical translation are encouraged to practise reading, writing, vocabulary, grammar, speaking. One of the main aims of foreign language teaching is to develop the student"s ability to communicate in the target language. Ross, (2000) states that translation is recognized as the fifth skill and the most important social skill, since it promotes communication and understanding.

As a form of communication, translation involves interaction and cooperation between people, which makes it a very useful tool in foreign language teaching.

Translation increases language awareness. While translating, students" attention is on identifying differences in structure and vocabulary. They have to evolve strategies to deal with them and to negotiate the potential of both languages. The real usefulness of translation in foreign language classes lies in comparison of grammar, vocabulary, word order and other language points in the target language and the student"s mother tongue. Students are directly exposed to contrasting language systems of the target and the native languages. Therefore, the learners should be required to discuss and correct common mistakes. It may be appropriate at this point to mention Perkins"s (1985) observations:

In order to develop in the students a linguistic awareness of contrast between L1 and L2 grammatical structures, and thus counteract interlingual interference, the teacher can quite legitimately get students to translate L1 sentences designed to pinpoint and clarify structures

and patterns the student still has not assimilated. The material for translation should be interesting and varied, expressive and related to the learners" knowledge.

As students should cover different aspects of the foreign language, the material is required to be authentic, diverse in terms of structure and function. The teacher"s task is to assess students" needs and select material to illustrate particular aspects of the language.

4.5. Reading Comprehension and the Quality of Translation

Translation is the process in which a piece of message is transferred from one language (ST) into another language (TT). "Many scholars believe in the reading-based notion of the translation" (Paul & Elder, 2002, p. 14). They assume that translation as a kind of reading, (suggesting) that the translator cannot be able to translate and transfer the material of the ST into the TT unless he grasps the content of the ST. Further, during the last fifty years, translation was deemed a tool for language learning. On those days, the method which was called grammar translation method was in its heyday and translation was of a secondary position. (Farahani M, 2015:50). Accordingly, Munday (2001:8) said:

> *The gearing of translation to language teaching and learning may partly explain why academia considered it to be of secondary statue. Translation exercises were regarded as a kind of learning a new language or of reading a foreign language text until one had the linguistic ability to read the original. Study of a work in translation was generally frowned upon once the student had acquired the necessary skills to read the original.*

It was assumed that within the process of translating source texts under instruction, students would be able to comprehend better the material in the target language and thus have a better performance in reading comprehension tests. Although this method was successful to some extent, it could not meet the needs of the students who wanted to be able to speak well in real situations. Meanwhile, with the initiation of communicative language teaching (CLT)

translation was no longer seen as a tool for better learning the second language (op.cit.). Regarding translation as a communicative activity, different scholars have contributed to connect it to language teaching." (op.cit.). "How can we understand that anybody who can read a text well can thus translate it more adequately? This question is at the center of any theory which regards translation as a kind of reading comprehension" (op.cit.). Actually, one of the most important problems in both theory and practice of translation has been the question of whether or not there is a relationship between comprehension ability and translation quality. This question is important in a sense that translation, at the first glance, seems to be a kind of reading, so that one first reads and then translates. So, this question is very important to determine the relationship between teaching reading comprehension skills and translation quality.

4.6. Topic Familiarity and Linguistic Difficulty

Whether a reader can comprehend a text being read or not depends on the topic familiarity (Ozuru, Dempsey & McNamara, 2009) and linguistic difficulty (RAND, 2002; Cohen, Glasman, Rosenbaun-Cohen, Ferrara & Fine, 1988) of the text as well as the reading skills and strategies of the reader. If the topic of the text is very unfamiliar to the reader, the content cannot be mapped onto the reader"s existing schemata (Mebarki, 2011). Thus, the reader will fail to make sense of the text or recall the information read (Carrell, 1983). Based on the schema theory, comprehension and recall of the information read depend on how the textual data match the readers" prior knowledge.

Reading is, therefore, viewed as a collaborative process between the readers" prior knowledge and the text. The interpretations of the author"s point of views, arguments and perspectives hinge on the readers" past experience, prior knowledge as well as cultural beliefs and prejudices (Bernhardt, 1984 cited in Barnett, 1989). Readers" prior knowledge that

matches the text content makes reading comprehension easier and retention of information better (Nassaji, 2002). However, incompatibility between both knowledge sources would result in retention difficulty even though the words and sentences are linguistically familiar and comprehensible (Urquhart & Weir, 1998).

Tertiary level EFL readers are assumed to have accumulated a wide range of prior knowledge in a variety of areas learnt in their L1. Researchers argue that in order to predict EFL reader"s performance on a particular reading task, his prior knowledge must be taken into consideration (Urquhart and Weir, 1998: 63; Mebarki, 2011). In addition, Koda (2005: 141) asserts that mature EFL readers already literate in their L1 usually rely heavily on their prior knowledge. Their reliance on previously acquired conceptual ICSSR E-JOURNAL OF SOCIAL SCIENCE RESEARCH 2013 (e-ISSN: 2289-4977) knowledge especially in highly specialized texts may lead to the utilization of top down processing to compensate for inadequate linguistic sophistication (ibid).

Clarke (1980) maintains that L2 proficiency is essential to L2 reading and that limited L2 proficiency will "short circuit" or "inhibit readers" good L1 reading from being transferred to and utilized in the L2 reading task; consequently. it triggers readers to employ poor reading strategies which would mainly be processing the text at word level. Carrell (1991) and Brisbois (1995) confirmed this notion by stating that linguistic knowledge contributes (30%) of the variance in L2 reading performance. Stanovich, (2000), highlights that L2 proficiency means that the reader possesses word recognition skills that enable automaticity in reading, the knowledge of syntax and profusion of vocabulary. On the other hand, if the text consists of a lot of new words or specific vocabulary, their newly acquired meaning will compete with other reading processing skills in the limited working memory. This will exhaust the capacity

of the working memory and constrain its meaning making process. As a result, reading becomes arduous and remains at word level.

4.7. Cognitive Strategies

While reading, readers may wish to combine between the information in the text, and their prior knowledge. Alternatively, there may be a breakdown in the information provided by one or more knowledge sources and, thus, comprehension of the text fails. In these circumstances, the readers may maximize understanding or resolve comprehension difficulty by taking certain deliberate actions (Urquhart & Weir, 1998). These actions are "cognitive strategies" employed by readers to process input from texts.

Paris, Wasik & Turner (1991: 610) consider cognitive strategies as a repertoire of strategies that readers employ to comprehend a text and these strategies are deliberate and calculated cognitive actions (Anderson, 1991) that help adjust reading behaviours and comprehension.

Cognitive strategies are divided into two categories, "higher-level" and "lower-level" strategies. Higher-level cognitive strategies are primarily guided by the readers" content and formal schemata or their acquired knowledge about the topic and organization of the text. These higher-level cognitive strategies also known as "top-down processing" are attempts that focus on synthesizing information from various sources in order to "conceptualize" the text content. They consist of actions such as relating new information to familiar concepts and prior knowledge, making predictions and inferences based on both new and previous information, summarizing, guessing meaning from context, hypothesizing, and elaborating (Block & Pressley, 2002; Paris, Wasik, & Turner, 1991; Pressley, 2006). Higher-level cognitive strategies may be used when the act of cognitive processing of the text does not

overwhelm the reader"s cognitive resources with is complex language structure and unfamiliarity of the topic.

On the other hand, the same reader may opt for "lower level" cognitive strategies and focus his or her attention more on linguistic processing when s/he is confronted with texts which are linguistically and conceptually more challenging. Lower-level cognitive strategies are actions directed towards breaking the linguistic codes such as decoding and recognizing words, syntactic structures and parts of speech, and translating words and phrases (Block, 1986; Cromley, Snyder-Hogan & Luciw-Dubas, 2010). The low-level strategies are also called "bottom-up processing". Lisson and Wixson, 1991, in Rumptz, (2003) assume that this model of reading is concerned primarily with the recognition of individual letters, phonemes and words that refer to the meaning of the whole text, starting from the word level, then the sentential level, and finally the text level. In other words, it involves moving from the smallest linguistic units until reaching the meaning of the text (James. E & Gentry, 2008). These lower-level cognitive strategies can normally be performed by skilled readers automatically with minimal cognitive effort; thus freeing the working memory for other higher-level processing that leads to comprehension (Phakiti, 2004). However, these lower-level cognitive strategies are often found to be „unsuccessful" strategies for comprehension of non-scientific texts and usually not associated with successful or good comprehension of scientific texts among native English readers (Cromley et al, 2010). Thus, the shift in strategy use is influenced by the reader"s conscious decision during reading (Koda, ICSSR E-JOURNAL OF SOCIAL SCIENCE RESEARCH 2013 (e-ISSN: 2289-4977) 96 2005) based on his or her current linguistic proficiency, depth of knowledge on the topic and the types of texts in hand.

Researchers in second language reading concur that the use of higher cognitive strategies often yield successful comprehension of L2 narrative and expository texts read and

vice versa for lower cognitive strategies. They are also in agreement that the use of higher level cognitive strategies would be inhibited by the limited linguistic knowledge of less proficient EFL learners, rendering them to use only lower level cognitive strategies such as decoding and translating. Yet, studies that look into strategy use in reading domain-specific and scientific texts yield conflicting findings. Anderson"s (1991) study revealed that less proficient EFL readers used less strategies but managed to score higher marks while reading academic reading texts. Chen and Donin (1997), too, found that less proficient EFL biology students did better than the more proficient EFL engineering students while reading biology texts. Both studies imply the utilization of higher level cognitive strategies such as accessing prior knowledge and inferring by the less proficient EFL readers to comprehend the domain-specific texts. Unfortunately, both studies did not specifically look into these higher level cognitive strategies to determine if they were in fact contributing to the successful comprehension of the academic and scientific texts

4.8. Editing and Proofreading Strategies

Editing and proofreading are two essential aspects of effective writing and effective translation. They represent the last steps in the ongoing process of brainstorming, planning, drafting, and revising. Editing is on the one hand, the process of examining a text with the intention of improving the flow and quality of writing. In other words, it is the process checking and improving the copywriting of a document or a translated text. This process focuses less on the form and more on the terminology. Editing undoubtedly helps assure translation quality (Dickins et al., 2002, p. 223, Hervey et al., 2000, p. 158) On the other hand, proofreading is the final stage of the editing process and should start only after all the editing revisions have been completed. Proofreading implies checking a translated document against the original and making sure that everything is correct. Pilotti et al. (2012) assert that

"roofreading (i.e., reading text for the purpose of detecting and correcting typographical errors) is viewed as a component of the activity of revising text and thus is a necessary (albeit not sufficient) procedural step for enhancing the quality of a written product". Translators who ignore any of these steps can end up with a translation that is unclear, and very difficult to correct. Even the smallest error can result in embarrassing outcomes. So, taking time and care is very important. The University of Minnesota"s Student Writing Guide, and The College of Education & Human Development Writing Center"shandout, (2004: 29) provide some strategies and guidelines in editing and proofreading as follows:

4.8.1. Leave yourself Plenty of Time:

During the different steps of the writing process, including editing: time is very important for the production of an efficient writing and an efficient translation. So, by following a timeline for the paper, students are more likely to have time to finish everything with the proper amount of care and attention. Also, students have to keep in mind that it may be best to put your paper aside for a day or so before proofreading and editing, as you may be more likely to catch errors or notice structural problems if your writing is not so "fresh" in your mind.

4.8.2. Get Acquainted with your Resources:

This strategy implies the use of resources. Students do not need to memorize every grammar or citation rule that may apply to the genre or discipline in which they are writing; they can look them up, by taking advantage of the resources available to them, such as: dictionaries, thesauruses, handbooks, citation guides, and handouts from class, librarians, and writing center consultants.

4.8.3. Know your Weaknesses:

Knowing weakness is a good way to improve writing. Therefore, it is advisable for students to keep a list of errors they tend to make: it will help them know what to look for when they edit; i.e., it helps iron out any little, unnecessary errors made by students. They can also read the paper once for each error type if they are only looking for one thing, they will be more likely to notice it.

4.8.4. Print a Copy of your Paper to Use when Editing and Proofreading:

This strategy helps students correct more efficiently their mistakes. It is much harder to catch errors on a screen than on a paper. It requires concentration and precision. Printing a copy is a good way to go about checking the logical flow of ideas in a text. This way, students can scribble corrections and new paragraphs in the margins of the print-outs.

4.8.5. Read your Paper out Loud:

Often, when we read silently, our eyes skip over small errors, awkward or run-on sentences, and mistakes. Yet, by reading out loud, students force themselves to notice everything from spelling and word choice to the structure of sentences. Students can also ask someone to read their paper aloud and tell them where they are confused.

4.8.6. Read your Paper Backwards:

Another way to force students to notice small details is to take things out of context. So, it is advisable for students to try to read their papers backwards, sentence by sentence or paragraph by paragraph, so that they can focus on the form of the text, not just the ideas. This technique is especially helpful for catching sentence fragments.

4.8.7. Check the Punctuation:

Checking punctuation is an important part in proofreading, As for it, it advisable for students to look over the paper on a sentence-by-sentence level to see if their punctuation is correct. Are commas in the right places? Are there any run-on sentences? If students are not sure about how to use certain kinds of punctuation, look in a manual, explore other quick tips, and/or ask a writing consultant for help.

4.8.8. Check Each in-Text Citation for Correct Format:

Checking citation consists at verifying if the source is cited in the Works or References list. This is also a good time to double-check the spelling of authors" names, book or article titles, and so on.

4.8.9. Reread Quotations:

Reading quotations is an important step in editing and proofreading. It helps the students check the quoted words and sentences, in terms of spelling (mistype) when copying words.

4.8.10. Get Feedback from Other People:

Because we are such a part of what we write, it can be difficult to step outside our work, and view it critically. When students look for feedbacks from others, they can break free of the isolation and absorption of writing and receive perspectives and insights that they may have otherwise missed. Hence, they are no longer left wondering whether they followed the guidelines of the assignment, whether their structure and language are clear, etc. By asking for feedback from other people, they are taking essential measures to improve their writing and to develop as a writer.

4.7.11. Do Not Rely solely on Computer Help:

This strategy implies student to be self-dependent. Computer's Spell-check and grammar-check tools are useful, but they do not constitute or substitute for proofreading. Hence, students need to develop and follow their own editing strategies, and do not be fooled into thinking that computer tools alone are adequate for the job.

4.7.12. Rest. Relax. Reread:

In this procedure, it is advisable for the students to leave what he wrote, or what he translated for a day or two. By this, the student will have some distance from what he wrote previously. As a result, he can make his proofreader's eye more clinical and perceptive. In addition, he may find changes that need to be made.

Conclusion

In a nutshell, we tried in this chapter to demonstrate the importance of reading comprehension strategies in generating interferences that may help students produce an effective translation of scientific and medical texts. First, we tried to define reading comprehension. Second, we presented an overview of vocabulary development in students. Finally, we stressed and mentioned some of the reading comprehension strategies that enable students to achieve comprehension in reading.

Accordingly, reading strategies play an important role in the promotion of reading comprehension, especially for poor readers who are always struggling in reading. According to U.S Department of Education (2014), Comprehension strategies are routines and procedures that readers use to help them make sense of texts.

CHAPTER FIVE

Students and Teachers Questionnaire

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Introduction

A questionnaire is a research instrument consisting of series of questions prompts for the purpose of gathering information. Accordingly, questionnaires have become undoubtedly one of the most common research instruments applies in all kinds of research. They are easy to assemble, capable of gathering a large amount of data in a short period of time and can be analysed more 'scientifically' and objectively than other forms of research. Brown (2001:6) defines questionnaires as: "any written instruments that present respondents with a series of questions or statements to which they react either by writing out their answers or selecting from among existing answers".

As for, our research aims on the one hand, to display the difficulties of translating medical terms and how they are tackled by first year master students of English. On the other hand, it attempts to identify the importance of reading comprehension strategies in achieving a good translation of medical texts. Therefore, the present chapter is devoted to the administration, description and interpretation of students" and teachers" questionnaires.

The students" questionnaire aims to collect information on students" standpoint regarding the translation of medical texts from English into Arabic in terms of strategies, terminological difficulties and solutions. The teachers" questionnaire aims to collect information on the Teachers" perceptions of the strategies adopted by the students in the translation of medical texts. It, also, attempts to give an overview of their opinion toward the use of reading comprehension strategies in translation.

5.1. The Students' Questionnaire:

5.1.1 Administration of the Students' Questionnaire

The questionnaire was handled out to fifty (50) first year master students from the Department of Letters and English Language, University of Frères Mentouri, Constantine, during the academic year 2012-2013. The students who filled the questionnaire represent our research sample that has been part of the experimental work. We gave them about thirty minutes to answer the questionnaire individually. Throughout the administration, we provided explanations whenever necessary to make sure that all students have understood the questions.

5.1.2. Description of the Students' Questionnaire

The students" questionnaire comprises twenty two (27) questions. It consists of a mixture of closed and open items to enable us collect accurate data. This questionnaire is composed of three main sections namely, Students knowledge of the scientific and Medical Texts, students" intricacies in the translation of medical texts and students" opinion regarding reading comprehension strategies.

↙ Section One: Students" Knowledge of Scientific and Medical Texts **(Q1-Q8)**

The aim of this section is to gather general information on the students" knowledge of the main features that characterize scientific texts, in general, and medical texts, in particular. It attempts to examine the students" knowledge of the strategies adopted in the translation of scientific and medical texts, and their awareness of the importance of selecting the adequate translation strategy.

↙ Section Two: Students" Intricacies in the Translation of Medical Texts **(Q9-Q 22)**

The objective of this section is to explore the students" views concerning the translatability of medical terms and the possible problems they may encounter while translating an English medical text into its Arabic equivalent.

↙ Section Three: Students" Opinion Regarding Reading Comprehension Strategies (Q23-Q27)

This section endeavours students" views concerning the use of reading comprehension strategies. Besides, it explores" students perceptions regarding the importance of learning reading comprehension strategies in improving their translation of medical texts.

5.1.3. Analysis of Students' Questionnaire Results

Section One: Students' Knowledge of the Scientific and Medical Texts

Question One:

Specify your gender, please

   a) Male

   b) Female

Table 5.1: Students' Gender

Suggestions	N°	%
a) Male	7	14
b) Female	43	86
Total	50	100

Figure 5.1: Students' Gender
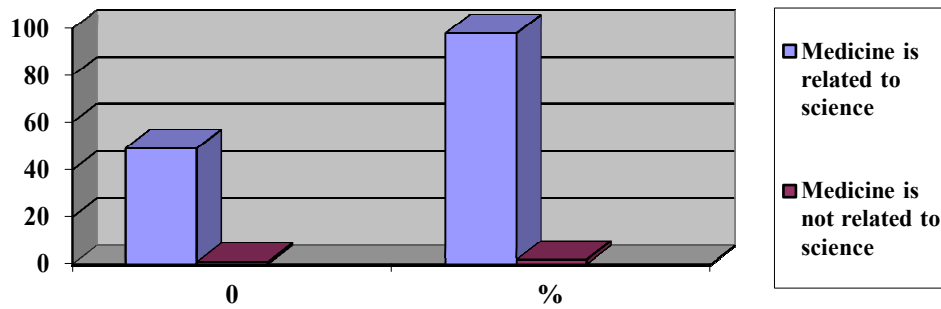
As presented in table and figure (5.1), the majority of the questioned participants are females (86) while (14%) of them are males. This reflects the overwhelming increasing number of girls in contrast to boys in our university.

Question Two:

What types of texts do you usually read?

    a) Literary texts

    b) Scientific texts

    c) General texts

    d) Others

Table 5.2: Types of Texts the Students Read

Suggestions	N°	%
a) Literary Texts	10	20%
b) Scientific Texts	7	14%
c) General Texts	30	60%
d) Others	3	6%
Total	50	100

Figure 5.2: Types of Texts the Students Read
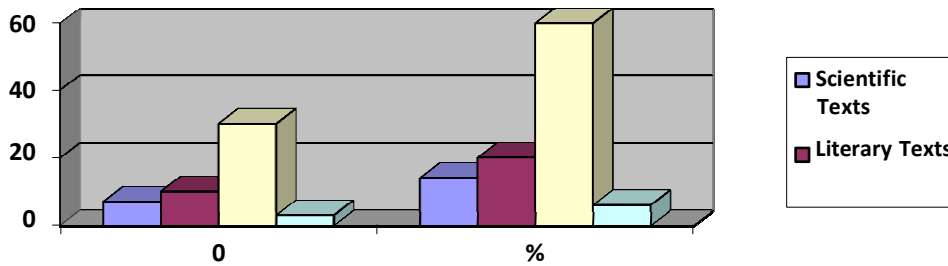
The result in table and figure (5.1) show that the majority of the students (60%) read general texts. However, (14%) prefer to read scientific texts. (20%) of them read literary texts, and (6%) read other types of texts such as, economic, political and religious texts.

Question Three:

Is a scientific text characterized by the use of:

    a) Logical expository and argumentative progression

    b) Lack of argumentative progression

    c) Extensive use of figurative expressions

    d) Denotative meaning

    e) Others

Table 5.3: Characteristics of Scientific Text

Suggestions	N°	%
a) Logical expository and argumentative progression	30	60%
b) Lack of argumentative progression	5	10%
c) Extensive use of figurative expressions	4	8%
d) Denotative meaning	9	18%
e) Others	2	4%
Total	50	100

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Figure 5.3: Characteristics of Scientific Text
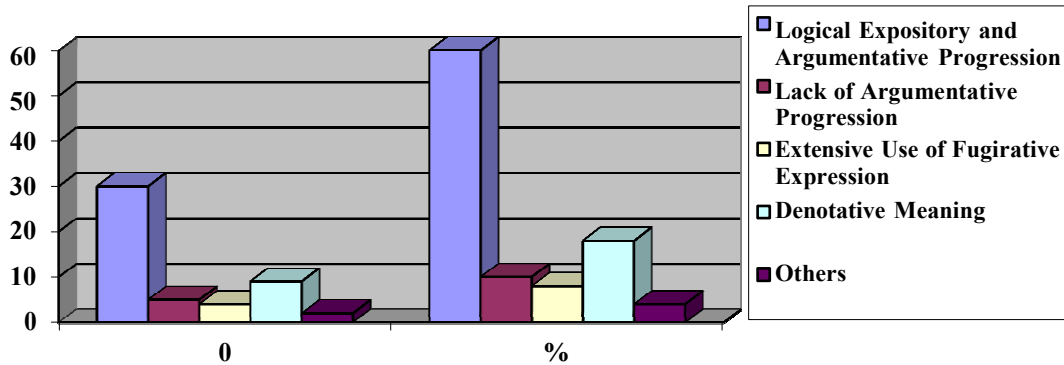
Table and figure (5.3) show that (60%) of the students consider logical expository and argumentative progression as a characteristic of a scientific text. (18%) of them deem denotative meaning a characteristic of a scientific text. However (10%) regard lack of argumentative expressions as a characteristic of a scientific text. (8%) assume that the use of figurative expressions is a feature of a scientific text and (4%) think that there are other characteristics that reflect a scientific text like clarity, the use of the present tense, the use of passive voice.

Question Four:

What is medicine?

Concerning this question, we have noticed that thirty students (58%) consider medicine as a branch of science that deals with the treatment of different diseases and illnesses. Fourteen students (28%) view medicine as the science which encompasses all aspects of human body components, analysis, diagnosis, treatments, and prevention. Five students (10%) restrict the meaning of medicine to be a part of science and one student (4%) ignores what is medicine.

Table 5.4: Students' Definition of the Term "Medicine"

Suggestions	N°	%
a) A branch of science that deals with the treatment of different diseases and illnesses.	29	58
b) the science which encompasses all aspects of human body, components, analysis, diagnosis, treatments, and prevention	14	28
c) A part of science	5	10
d) Do not know	2	4
Total	50	100

Figure 5.4: Students' Definition of the Term "Medicine"
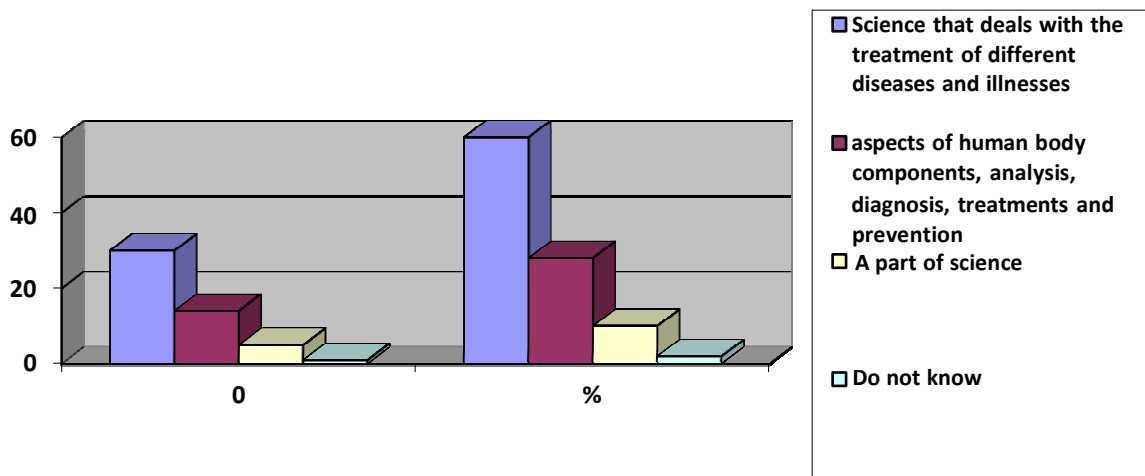
Question Five:

What is the difference between science and Medicine?

Regarding this question, we observed that the majority of the students– fourty nine- (98%), related medicine to Science; a branch of science that is mainly concerned with the description of all aspects relates to the human body. Only one student (2%) was unable to relate   medicine   to   science.

Table 5.5: The Difference between Science and Medicine

Suggestions	N°	%
Medicine is related to science	49	98
Medicine is not related to science	1	2
Total	50	100

Figure 5.5: The Difference between Science and Medicine
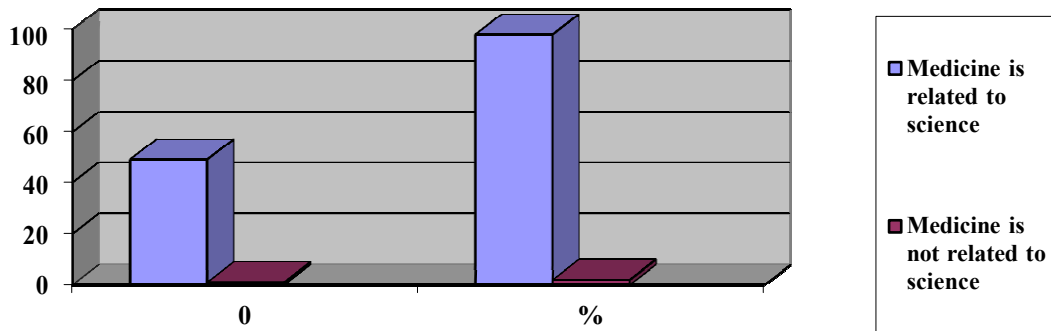
Question Six:

According to you, what is the main aim of a scientific translator?

In relation to this question, we have come to the conclusion that Thirty two students (64%) view that the role of a scientific translator is to inform target readers about medical findings and discoveries. Ten Students (20%) regard the main aim of a scientific translator is to try to transfer and maintain the source scientific message as faithfully as possible. Five students (10%) relate the importance of a scientific translator to find equivalence to the new coined terms of the scientific findings and discoveries. Three Students (6%) were unable to give an answer to this question.

Table 5.6: Aim of the Scientific Translator

Suggestions	N°	%
a) Inform target readers about medical findings and discoveries	32	64
b) Maintain the source scientific message	10	20
c) Find equivalence to scientific terms	5	10
d) Do not know	3	6
Total	50	100

Figure 5.6: Aim of the Scientific Translator
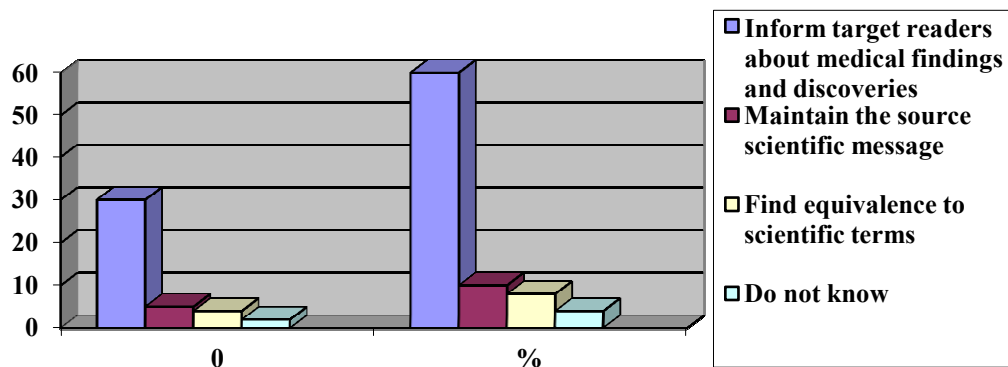
Question Seven:

Do you practise translation outside you syllabus programmes?

     a) Yes

     b) No

Table 5.7: Translation Practice outside Syllabus Programme

Suggestions	0	%
Yes	14	28
No	36	72
Total	50	100

Figure 5.7: Translation Practice outside Syllabus Programme
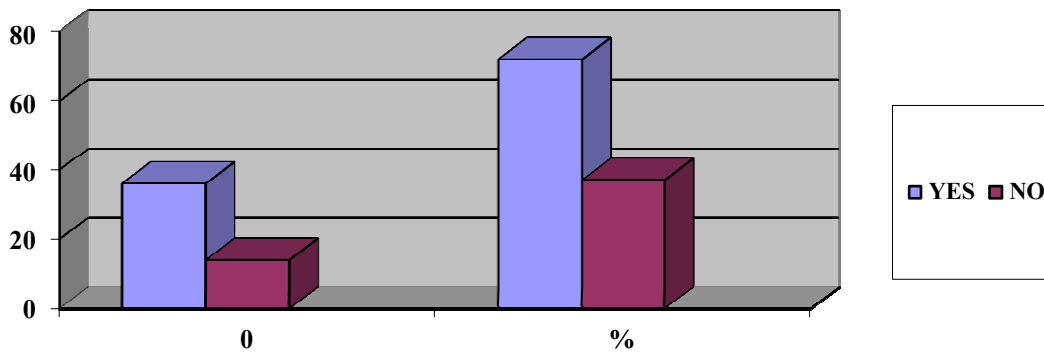
As can be seen in table and figure (5.7), the Majority of the students (72%) do not practise translation outside their syllabus programme. Only (28%) of the students do practise translation outside their syllabus programme.

Question Eight:

If your answer is „yes", is it:

    a) Often

    b) Sometimes

    c) Occasionally

Table 5.8: Translation Frequency

Suggestions	N°	%
a) Often	3	20
b) Sometimes	7	50
c) Occasionally	4	28.75
Total	14	100

Figure 5.8: Translation Frequency
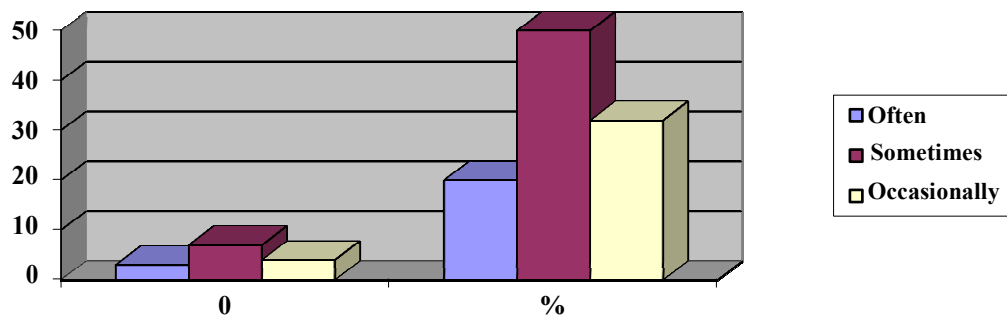
The result in table and figure (5.8) show that among the fourteen students who assume to practise translation outside their syllabus programme, three of them (20%) claim to practice frequently translation outside their syllabus programme whereas seven students (50%) do sometimes practise translation outside their syllabus programme. Four students (28.75%) declare to practise occasionally translation outside their syllabus programme.

Section Two: Students' Intricacies in the Translation of Medical Texts

Question Nine:

What is the first thing you do when you are asked to translate a medical text?

Regarding this question, we noticed that: The majority of the students (64%) revealed that the first thing they do when they are asked to translate a medical text is to look for the

specialized medical terms, analyse them and try to find their target equivalent meanings. (20%) of the students read the medical text entirely before translating it.(10%) of the students admit their ignorance related to the first step to be done in the translation of medical texts. (6%) of the students did not answer the question.

Table 5.9: the First Thing to Do when Translating Medical Texts

Suggestions	N°	%
a) Find equivalents for the specialized terms	32	64
b) Read the medical text	10	20
c) Ignore what to do as a first step	5	10
d) No answer	3	6
Total	50	100

Figure 5.9: the First Thing to Do when Translating Medical Texts
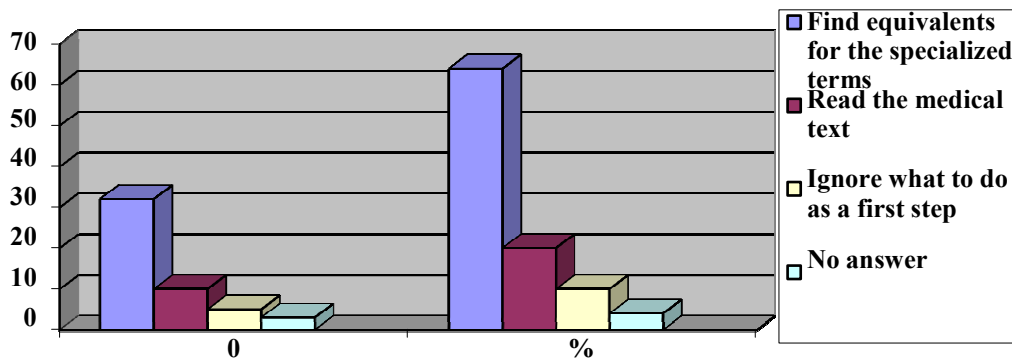
Question Ten:

What kind of strategy do you use in your translation of medical Texts?

a) Literal translation

b) Loan translation

c) Free translation

d) Transliteration

e) Others.

Table 5.10: Students' Strategies in Medical Translation

Suggestions	N°	%
a)literal translation	30	60
b) loan translation	5	10
c) Free translation	9	18
d) Transliteration	2	4
e) others	4	8
Total	50	100

Figure 5.10: Students' Strategies in Medical Translation
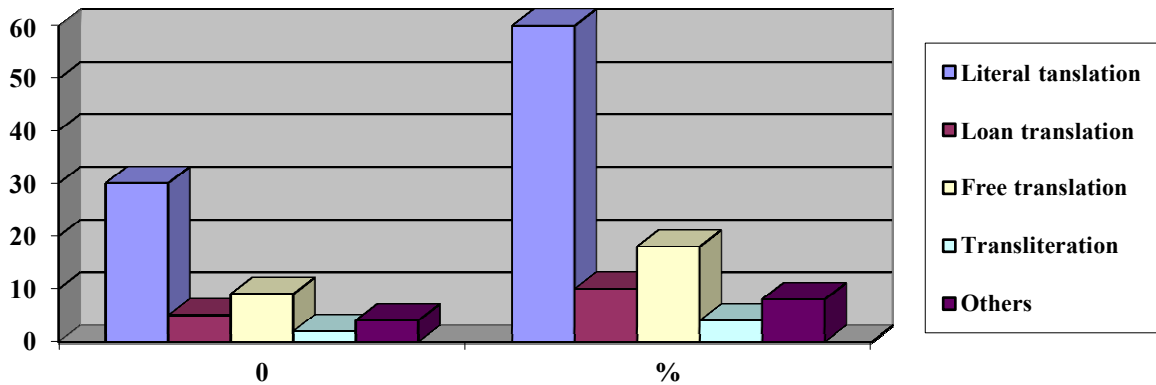
Table and figure (5.10) reveal that the majority of the students (60%) consider literal translation as the most adequate procedure in the translation of medical texts. (18%) of them regard free translation as the most adequate translation procedure of medical texts. (10%) of the students prefer to use loan translation. (4%) of the student rely on the transliteration procedure and (8%) of them consider that there are other strategies that can be used for the translation of medical texts.

Question Eleven:

What do you consider as the most difficult aspect(s) in the translation of a medical text?

       a) The choice of appropriate expressions

       b) Clear understanding of the source text message

       c) The ability to deliver the source text message into a meaningful target

       d) terminology

Table 5.11: The Most Difficult Aspect (s) in Medical Translation

Suggestions	N°	%
a) The choice of the appropriate expressions	5	10
b)Clear understanding of the source text message	2	4
c)The ability to deliver the source text message	3	6
d) Terminology	40	80
Total	50	100

Figure 5.11: The Most Difficult Aspect (s) in Medical Translation
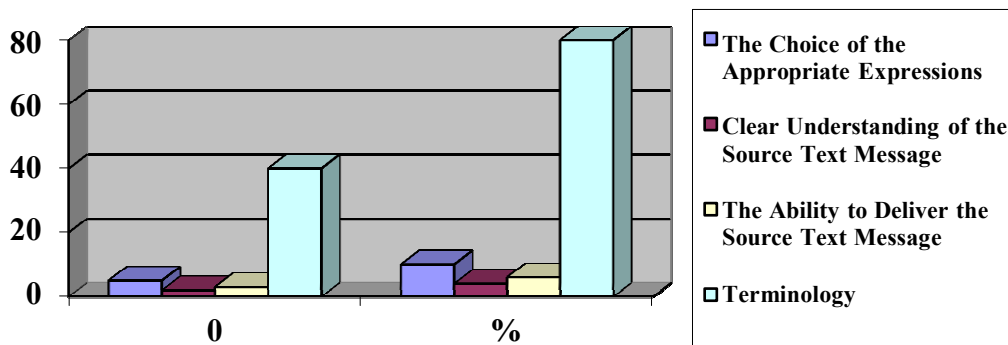
From table and figure (5.11) we deduce that most students (80%) consider terminology as the most difficult aspect of the medical translation. (10%) of the students regard the choice of the appropriate expression as the most critical aspect of the medical

translation, whereas (6%) of the students think that the ability to deliver the source text message is the most significant aspect of the medical translation. Only (4%) of the students regard clear understanding of the source text message as an important feature in the translation of medical texts.

Question Twelve:

To what extent do you think is the translation of medical texts from English into Arabic possible?

Regarding this question, we noticed that almost all the students (70%) consider the lexical gap that exists between English and Arabic problematic in medical translation. The remaining Students (30%) did not answer the question.

Table 5.12: Translatability of Medical Texts

Suggestions	N°	%
Lexical gap	35	70
Did not answer	15	30
Total	50	100

Figure 5.12: Translatability of Medical Texts
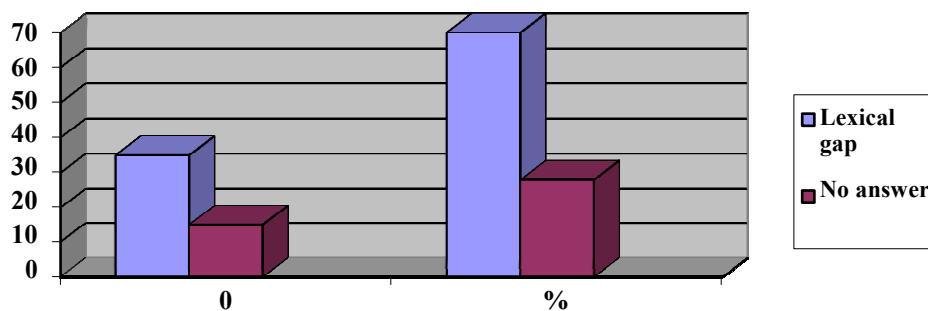
Question Thirteen:

How useful would a corpus or glossary of medical terminology be to your translation?

Concerning this question, we noticed that the majority of the students (50%) consider a corpus or glossary of medical terminology useful in making intelligible the medical terms since most of the medical terms are derived from Greek and Latin. However, (26%) of the students consider that a corpus of medical terminology is useless since most of the medical translators transliterate the Greek and Latin words. (20%) of the students regard a corpus or glossary of medical terminology useful to some extent. (4%) of the student do not know how a corpus or glossary can be useful in translation.

Table 5.13: Use of Corpus Glossary in Medical Translation

Suggestions	N°	%
a) Help in making medical terms intelligible	25	50
b) Useless when words are transliterated	13	26
c) Useful to some extent	10	20
d) Do not know how it can be useful	2	4
Total	50	100

Figure 5.13: Use of Corpus Glossary in Medical Translation
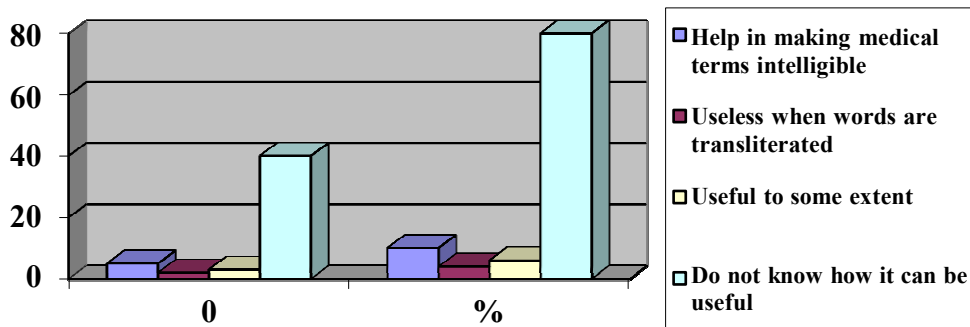
Question Fourteen:

Are « False friends» or « Faux Amis »:

     a) Words that are spelled differently but have the same meaning

     b) Words that are spelled in the same way but have different meanings

     c) Compound words

     d) Others

Table 5.14 : « Faux Amis » False Friends

Suggestions	N°	%
a) words that are spelled differently but have the same meaning	3	6
b) Words that are spelled in the same way but have different meanings	45	90
c) Compound words	1	2
d) Others	1	2
Total	50	100

Figure 5.14: « Faux Amis » False Friends
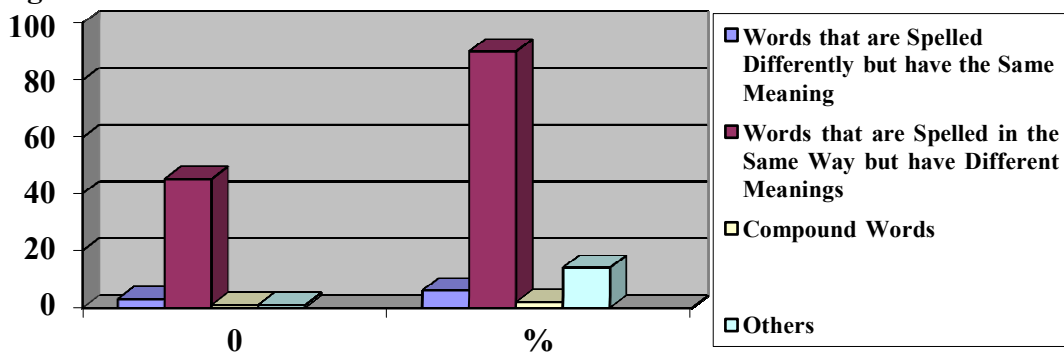
Table and figure (5.14) show that the majority of the students (90%) consider "Faux Amis" as words that are spelled in the same way but have different meanings. (6%) of the students regard "Faux Amis" as words that are spelled differently but have the same meaning.

(2%) of them consider Faux Amis" as compound words and (2%) of the students relate "Faux Amis" to other definitions.

Question Fifteen:

How frequently do you encounter "faux amis" "False friends" in your translations of medical texts?

         a) Often

         b) Sometimes

         c) Occasionally

Table 5.15: Translation Frequency of "Faux Amis" False friends

Suggestions	N°	%
a) often	4	8
b)Sometimes	14	28
c)Occasionally	32	64
Total	50	100

Figure 5.15: Translation Frequency of "Faux Amis" False Friends
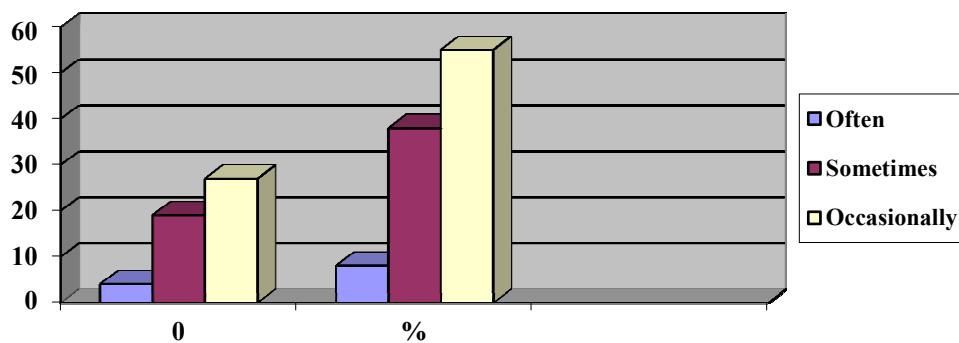
Table and figure (5.15) reveal that the majority of the students (64%) assume to occasionally encounter "Faux Amis" in the translation of medical texts. (28%) of them declare to sometimes encounter Faux Amis in this type of translation. Only (8%) of the students assume to often encounter Faux Amis in the translation of medical texts. This result can be justified by the fact that the writing systems used in English and Arabic are totally different, moreover, English and Arabic are not genetically related, since they belong to the Indo-European and Semitic families, respectively. Al-Wahy (2009:101)

Question Sixteen:

Do "Faux *Amis*" "*False friends*" cause you problems in your translation of medical texts?

    a) Yes

    b) No

    c) I don"t know

Table 5.16: Problems Related to the Translation of "False Friends"

Suggestions	N°	%
Yes	29	58
No	16	32
I don"t know	5	10
Total	50	100

Figure 5.16: Problems Related to the Translation of "False Friends"
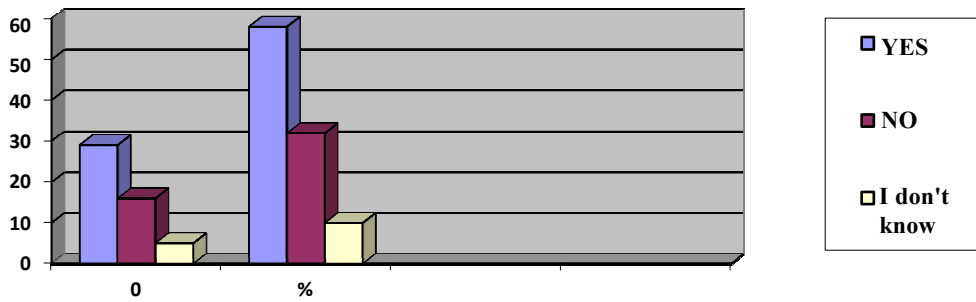
Table and figure (5.16) reveal that most students (58%) consider that "Faux Amis" can problematic to the translation of medical texts, whereas (32%) of them do not consider it problematic as far as English and Arabic has completely different linguistic systems. (10%) of the students do not know if "Faux Amis" are problematic to the translation of medical texts.

Question Seventeen:

If your answer is yes, how do you deal with them?

Concerning this question, we noticed that among the of the twenty nine students (29) who consider "Faux Amis" problematic for the translation of medical texts, most of them (21) view glossaries and dictionaries as the most appropriate method that may help the student avoid such problems. The other students (8) consider translation practice as the best way to enrich ones vocabulary and avoid problems of "Faux Amis".

Table 5.17: Students' Solutions to "Faux Amis"

Suggestions	N°	%
a) The use of glossaries and dictionaries	21	72.41 %
b) Translation practice	8	27.58 %
Total	29	100

Figure 5.17: Students' Solutions to "Faux Amis"
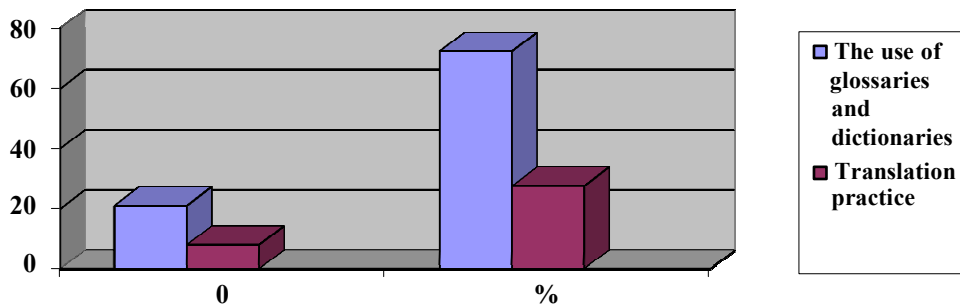
Question Eighteen:

How effective and understandable is the translation of the source medical text for the target audience?

Regarding this question, most of the students (60%) regard style and Terminology as the most prominent features that ensure a faithful translation of medical texts. (24%) of the students consider the translation of medical texts difficult to be achieved. The rest of the students (16%) didn"t answer the question.

Table 5.18: Students' Understanding of the Source Medical Text

Suggestions	N°	%
a) Style and Terminology ensure a faithful translation of medical texts	30	60
b) Medical translation is difficult to be achieved	12	24
c) Did not answer	8	16
Total	50	100

Figure 5.18: Students' Understanding of the Source Medical Text
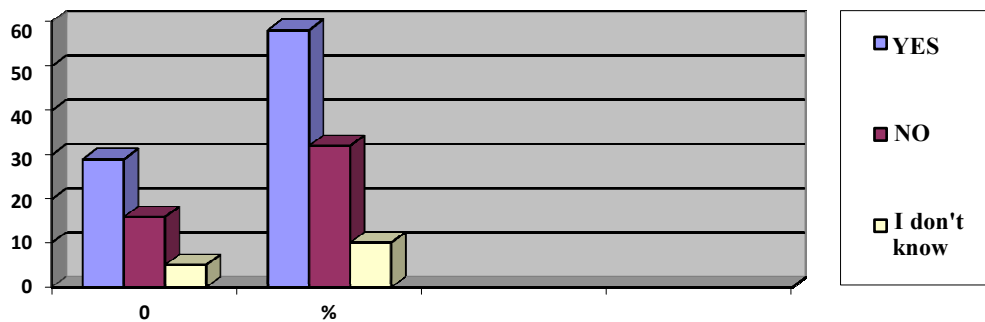
Question Nineteen:

Are you satisfied with the course material provided to the translation of medical texts?

    a) Yes

    b) No

    c) I don"t know

Table 5.19: Students' Satisfaction with the Course Materials

Suggestions	N°	%
Yes	9	18
No	37	74
I don"t know	4	8
Total	50	100

Figure 5.19: Students' Satisfaction with the Course Materials
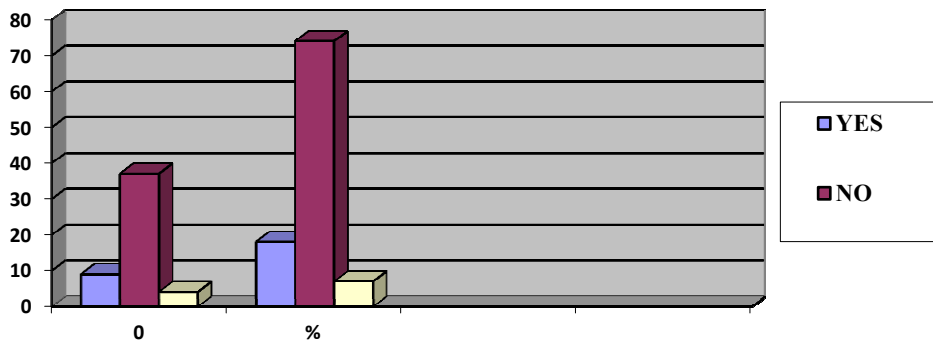
Table and figure (5.19) reveal that the majority of the students (74%) claim not to be satisfied with the course materials provided for the translation of medical texts. Only (18%) of the students are satisfied with the course materials. (8%) of the students do not know the efficiency of the course materials.

Question Twenty:

If your answer is No, Please explain why?

As far as this question is concerned, we noticed that among the thirty seven (37) students who are not satisfied with the course materials, sixteen of them (16) consider the selected texts too difficult for them. Indeed, the specialised vocabulary that characterizes scientific texts, in general, and medical texts, in particular is sometimes difficult to be handled by nonprofessional translator. In addition to that, twenty one (21) students consider that the allocated time devoted to the translation of scientific texts, in general, and medical texts, in particular, is not enough to enhance the students" translation of medical texts.

Table 5.20: Students' Nonsatisfaction with the Course Materials

Suggestions	N°	%
a) Quality of the course material	16	43.24
b) Allocated time devoted to translation	21	56.75
Total	37	100

Figure 5.20: Students' Nonsatisfaction with the Course Materials
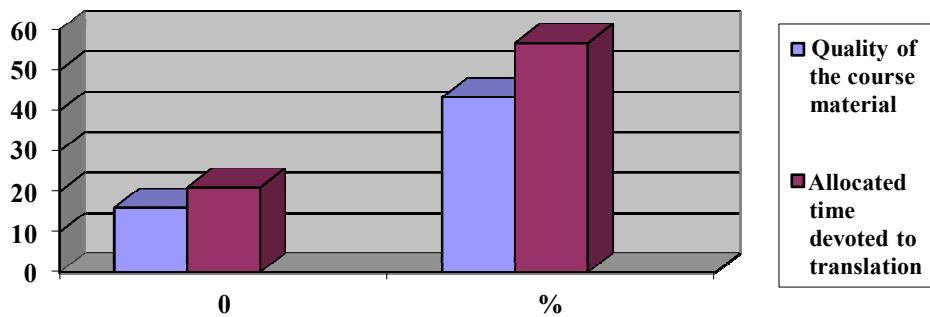
Question Twenty One:

Are you satisfied with the teaching methods adopted in the course?

        a) Yes

        b) No

        c) I don"t know

Table 5.21: Students' Satisfaction with the Teaching Methods

Suggestions	N°	%
Yes	28	56
No	17	34
I don"t know	5	10
Total	50	100

Figure 5.21: Students' Satisfaction with the Teaching Methods
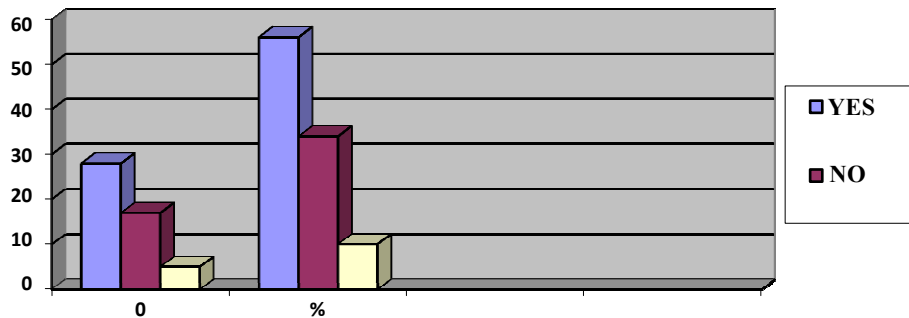
Table and figure (5.21) reveal that the majority of the students (56%) are satisfied with the teaching methods in the course whereas, (34%) of them claim not to be satisfied with the teaching methods. only (10%) of the students don"t have an idea about the quality of the teaching methods.

Question Twenty Two:

If your answer is No, please explain why?

Concerning this question, we noticed that among the seventeen (17) students who claim not to be satisfied with the teaching method; nearly the majority of them (14) relate it to the inadequate time table available for teachers of translation. However, (3) Students

claim that in translation courses, students are not always supplied with a translation model to the treated texts which hamper their progress in translation.

Table 5.22: Students' Nonsatisfaction with the Teaching Method

Suggestions	N°	%
Inadequate available time table	16	60.71
Inappropriate translation strategies	1	39.28
Total	17	100

Figure 5.22: Students' Nonsatisfaction with the Teaching Method
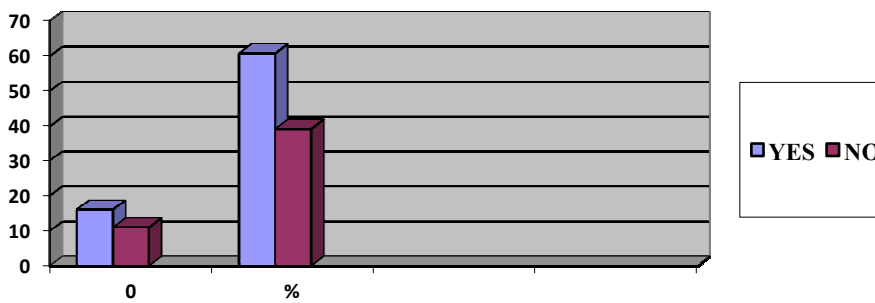
Section Three: Students' Opinion Regarding Reading Comprehension

Question Twenty Three:

Do you apply some reading comprehension strategies such as prediction, skimming, scanning…etc. to understand what you read?

    a) Yes

    b) No

Table 5.23: Students' Use of Reading Comprehension Strategies

Suggestions	N°	%
Yes	31	62
No	19	38
Total	50	100

Figure 5.23: Students' Use of Reading Comprehension Strategies
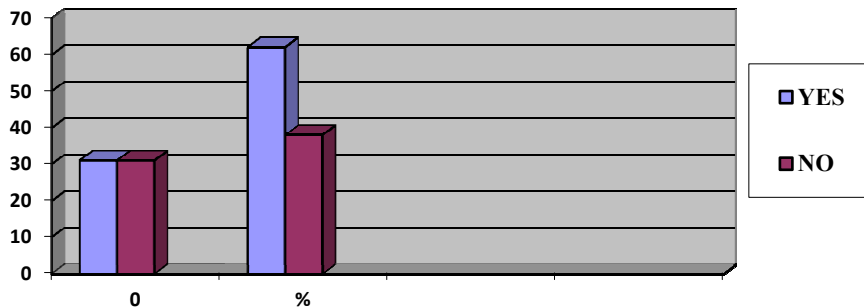
Table and figure (5.23) show that the majority of the students (62%) assume to use reading comprehension strategies to understand what they read. Only (38%) of them do not use reading comprehension strategies to comprehend what they read.

Question Twenty Four:

Do you read texts quickly to get an overview of its content when you are asked to translate? If yes, please, say why.

    a) Yes

    b) No

Table 5.24: Students' Quick Reading

Suggestions	N°	%
Yes	39	78
No	11	22
Total	50	100

Figure: 5.24 Students' Quick Reading
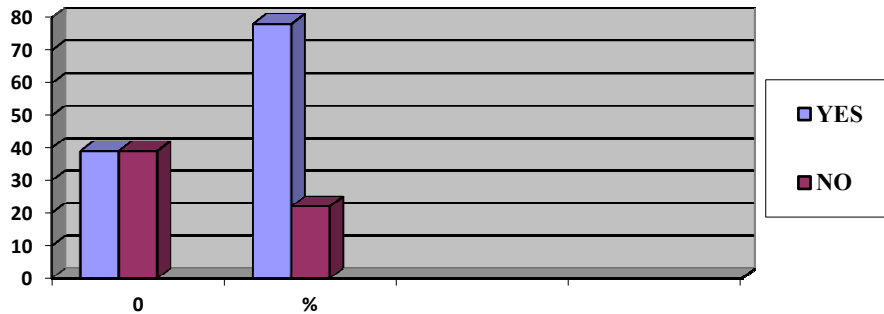
Regarding this Question, most of the students (78%) affirm to read texts quickly when they are asked to translate to get a general idea about a given text. Only (11%) of them assume to take their time in reading carefully a text before translating it. Among the students who assume to read texts quickly when they are asked to translate, (21) students related it to the limited time devoted to translation. The other students, (18) prefer to focus on the difficult terms which can be problematic in translation.

Question Twenty Five:

When you read do you relate the text to your background knowledge?

    a) Yes

    b) No

Table 5.25: Students' Use of their Background Knowledge in Reading

Suggestions	N°	%
Yes	47	94
No	3	6
Total	50	100

Figure 5.25: Students' Use of their Background Knowledge in Reading
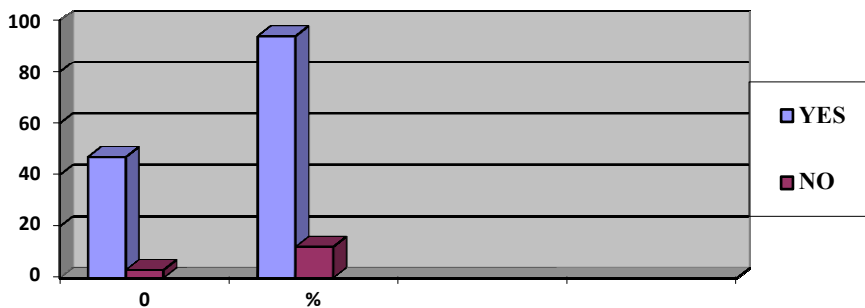
As far as this question is concerned, we noticed that most of the students (94%) use their background knowledge and then relate it with the ideas of text. Only (6%) of them assume not to use it in reading and comprehending texts.

Question Twenty Six:

Do you guess the meaning of words from their context in the text?

  a) Yes

  b) No

Table 5.26: Students' Attempt to Guess Meanings from Contexts

Suggestions	N°	%
Yes	22	44
No	28	56
Total	50	100

Figure 5.26: Students' Attempt to Guess Meanings from Contexts
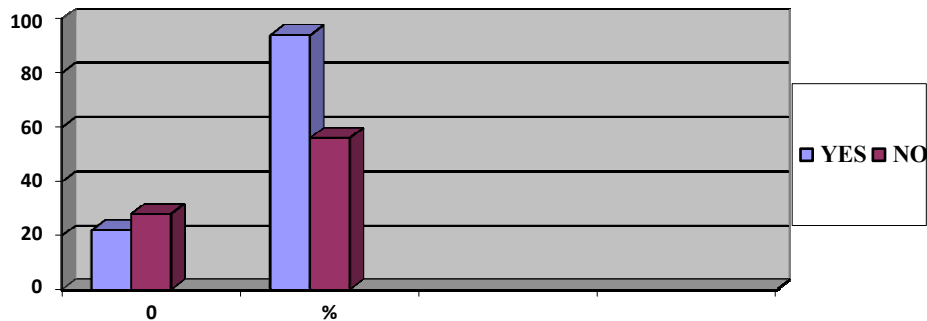
Table and figure (5.26) show that (44%) of the students guess the meaning of some words from their context in order to both save time and continue reading without any interruption. However, (56%) of them reveal not to guess the meaning of words from context especially when dealing with scientific texts where most of its terms are of Greek and Latin origins.

Question Twenty Seven:

Do you think that learning reading comprehension strategies may help you to achieve reading comprehension during your study?

a) Yes

b) No

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Table 5.27: Learning Reading Comprehension Strategies

Suggestions	N°	%
Yes	46	92
No	4	8
Total	50	100

Figure 5.27: Learning Reading Comprehension Strategies
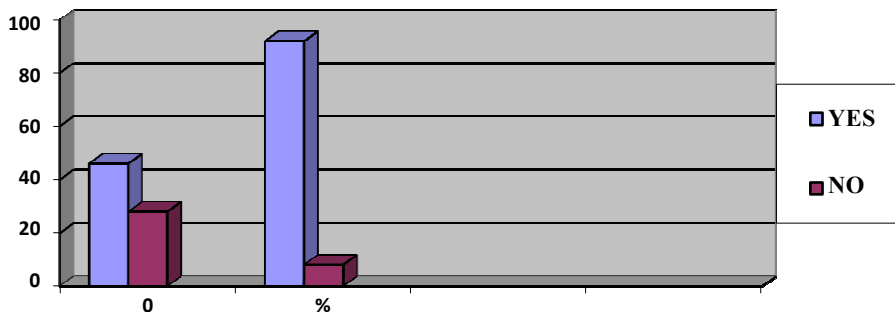
Concerning this question, we noticed that the majority of the students (92%) consider that learning reading strategies will help them to be good readers and will help them to solve problems in reading. As a result, they can understand better texts and produce an effective translation of it.

5.1.4. Discussion of the Students' Questionnaire Results

The analysis of the students" questionnaire shows that First year master degree students:

- Are not interested and motivated by scientific and medical texts. This is reflected in question one, where the majority of the students assume to be interested in reading literary (20%) and general texts (60%) rather than reading scientific texts. This answer can be justified by the fact that scientific texts, in general, and medical texts in

particular contain specific jargon that cannot be found in other types of texts. This specific language makes scientific and medical texts inaccessible for students who are not specialist on the field of science and medicine. Zinsser (1976:15) explains that: "every profession has its growing arsenal of jargon to fire at the lay man and hurls him back from its walls." In addition, most students seem to be unable to give a clear definition to the term "medicine".

- The students seem to reduce the role of the scientific translator to that of a mediator between the source and target text. This can be noticed in question five where only 10% of the students relate the importance of a scientific translator to in the coining of exact scientific terms to scientific findings and discoveries.

- The students seem to be aware of the features that distinguish scientific texts from other types of texts as illustrated in question two. They are also conscious of the problems and intricacies related to their translation such as the problem of terminology and false friends (cognates) as demonstrated in the second section of the students" questionnaire.

- A vast majority of the students rely on literal, transliteration and loaning in their translation of medical texts. This is reflected in questions Ten, eleven, twelve and Thirteen where the majority of the students assumed to focus more on the translation of the medical terminology.

- The students are not satisfied with the course syllabus available to the translation of medical texts. They consider that more time should be given to the translation of scientific and medical texts.

- The students are not satisfied with the methods employed in the translation of medical texts. According to them, teachers have to establish and design lectures in which

techniques will be thought to students in order to help them improve their translation of medical texts.

' The students seem not aware of the importance of reading comprehension in achieving a good translation of medical texts. They rather prefer to look directly for the meaning of words as isolated items.

' The students use some of reading strategies automatically (62%), but unfortunately they ignored how to apply these strategies appropriately.

' The students assume not to take time in reading texts when they are asked to translate (78%). They rather prefer looking for the meaning of difficult words, and then translate them as isolated items (22%).

' The majority of the respondents (55%) agree that teaching reading strategies may help them during their study to solve the problem of reading comprehension and, hence, help them produce a better translation of medical texts.

Conclusion:

By and large, the analysis of the results we inferred from the students „questionnaire provides sufficient indicators that the majority of English first year master students, at the department of English, Faculty of letters and Languages, seem to have approximate knowledge of scientific and medical texts. Yet, terminology which is considered as one of the irritating and frustrating area of the medical translation seems to pose problem in their translation of medical texts. In addition, the students seem not to take into consideration the importance of reading comprehension strategies in achieving a good translation of medical texts. That is why they should be interest not only in reading but also learning some of these strategies to be effective readers, and efficient translators. Unfortunately, this cannot be achieved unless teachers teach them how to use some of these strategies to be successful in reading and translating medical texts.

5.2. Teachers' Questionnaire

5.3. Administration of the Teachers' Questionnaire

Twenty questions were handled to teachers of translation at the department of letters and English Language, University of Frères Mentouri, Constantine. The questionnaire was administered at nearly the beginning of the second semester of the academic year 2012-2013. Of the total number of the questionnaires (20), fifteen of them were given back. Some of them were collected the same day, while others were collected days later due to the teachers" lack of time.

5.2.1. Description of the Questionnaire

The questionnaire comprises a total of twenty nine questions. They are a mixture of closed-ended and open-ended questions divided into three sections, General information, teachers" perceptions about students" translation of medical texts and teachers" views regarding the use of reading comprehension in translation classes.

↙ Section one: General information: **(Q1-Q7)**

This section tends to gather data about teachers opinions concerning the translation of scientific and medical texts in terms of style and terminology.

↙ Section Two: Teachers" procedure in initiating students to the translation of medical texts. **(Q8-16).**

This section seeks to probe teachers" opinion on the procedure followed in the translation of medical texts. It also explores their perceptions of the students" difficulties in the translation of medical texts.

↗ Section Three: Teachers views regarding the use of reading comprehension strategies in translation **(Q17-Q20)**

Questions in this section are designed to uncover teachers" views regarding the use of reading comprehension in translation classes. In addition, they cover inquiries on the way teachers deal with reading comprehension strategies in translation classes.

Analysis of the Teachers Questionnaire Results

Section One: General Information

Question One

Degree held

      a) BA

      b) Master

      c) Magister

      d) PhD

Table 5.28: Teachers' Degree

Suggestions	N°	%
a) BA	0	0
b) Master	7	46.66
c) Magister	5	33.33
d) PhD	3	20
Total	15	100

Figure 5.28: Teachers' Degree
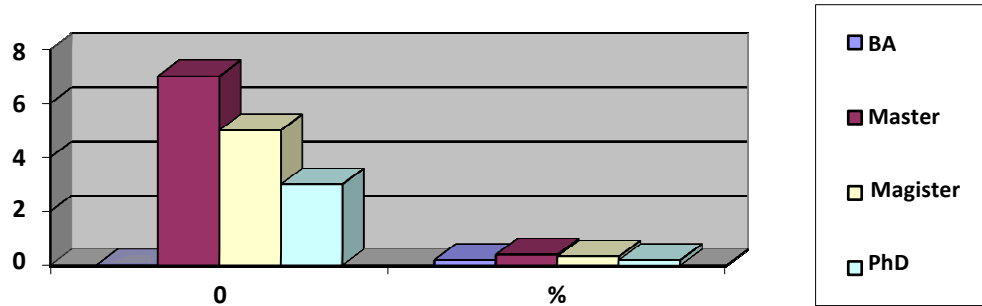
Table and figure (5.28) show that the majority of the questioned teachers (46.66) have a master degree. (33.33%) of them have a Magister and only Three have a Doctorate.

Question Two:

What type of texts do you often give to your students to translate?

   a) Literary texts
   b) Scientific texts
   c) General texts
   d) Others

Table 5.29: Type of Texts Given to Students in Translation

Suggestions	N°	%
a) Scientific texts	3	20
b) Literary texts	6	40
c) Historical texts	2	13.33
d) General texts	4	26.66
Total	15	100

Figure 5.29: Type of Texts Given to Students in Translation
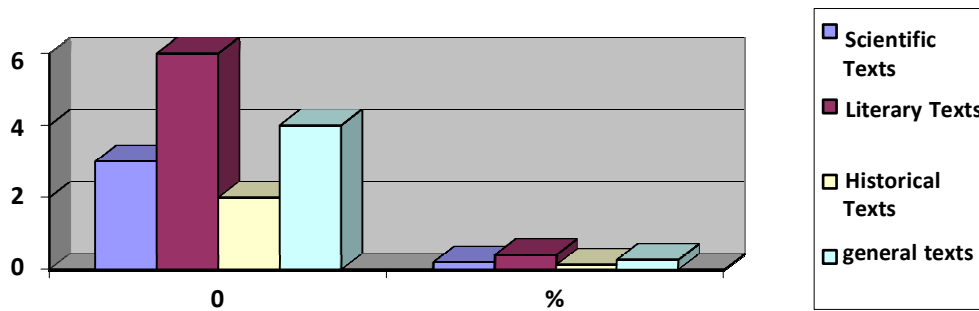
Table and figure (5.29) reveals that (40%) of the teachers give their students literary texts to be translated. (26.66%) of them focus on the translation of general texts. Only (20%) of the teachers suggest the translation of scientific texts to their students, and (13.33%) prefer to expose their students to the translation of historical texts.

Question Three

Are the selected texts based on the students" interests or are they based on the students" needs? Why?

    a) Students" interests

    b) Students" needs

Table 5.30: Motives behind the Selected Texts

Suggestions	N°	%
a) Students" interests	4	26.66
b) Students" needs	11	73.33
Total	15	100

Figure 5.30: Motives behind the Selected Texts
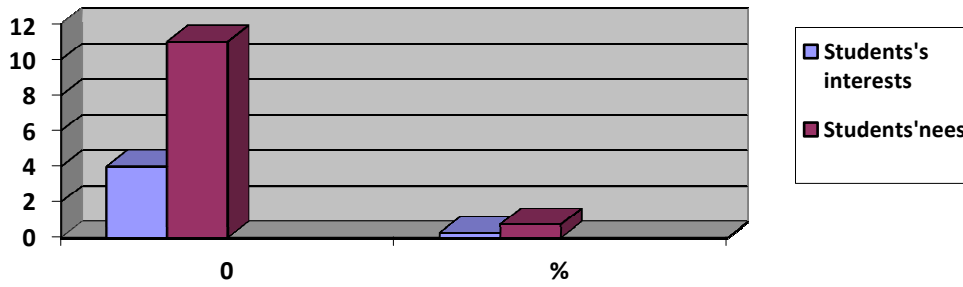
Table and figure (5.30) show that the majority of the teachers (73.33) select texts based on the students" needs to help the students acquire the necessary style and vocabulary needed in the translation of different types of texts. Only (26.66%) of them select texts to be translated based on the students" interest.

Question Four:

Are the translation basics enough for the students" successful translation?

      a) Yes

      b) No

If no, justify your answer please

Table 5.31: Rate of the Translation Basics

Suggestions	N°	%
a) Yes	3	20
b) No	12	80
Total	15	100

Figure 5.31: Rate of the Translation Basics
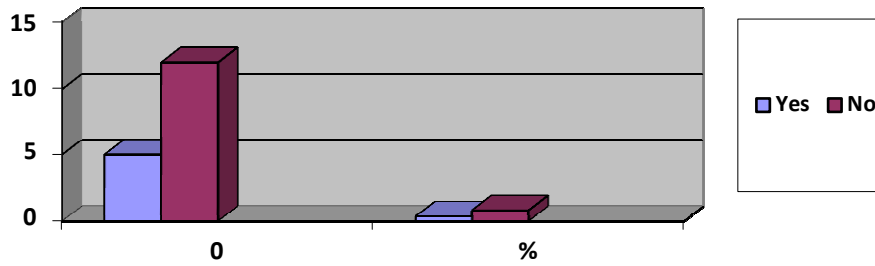
Table and figure (5.31) reveals that the majority of the teachers (80%) assume that translation basics are not enough for a successful translation .They consider that other factors should be taken into consideration by the students, while rendering the English source text into its Arabic equivalent. Only (20%) of the teachers consider that translations basics enough for the translation of medical texts from English into Arabic.

Question Five:

Do you introduce your students to the translation of medical texts?

    c) Yes

    a) No

Table 5.32: Students' Translation of Medical Texts

Suggestions	N°	%
a) Yes	6	40
b) No	9	60
Total	15	100

Figure 5.32: Students' Translation of Medical Texts
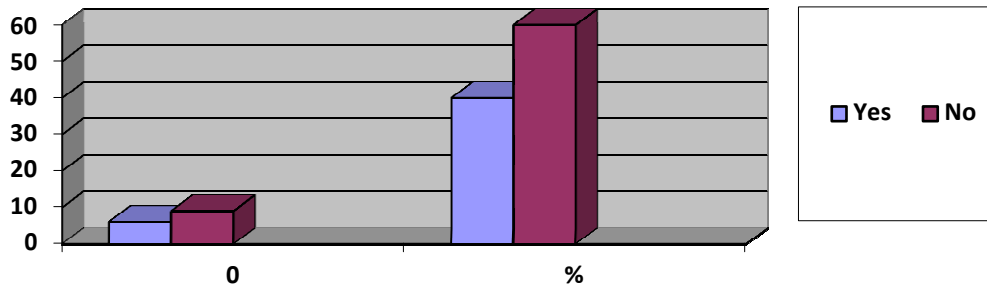
Table and figure (5.32) show that the majority of the teachers (60%) do not introduce their students to the translation of medical texts. Only (40%) of the teachers introduce their students to the translation of medical texts from English into Arabic.

Question Six:

If yes, how often please?

    a) Frequently

    b) Sometimes

    c) Occasionally

Table 5.33: Translation Frequency of Medical Texts

Suggestions	N°	%
a) Frequently	0	0
b) Sometimes	2	33.33
c) Occasionally	4	66.66
Total	6	100

Figure 5.33: Translation Frequency of Medical Texts
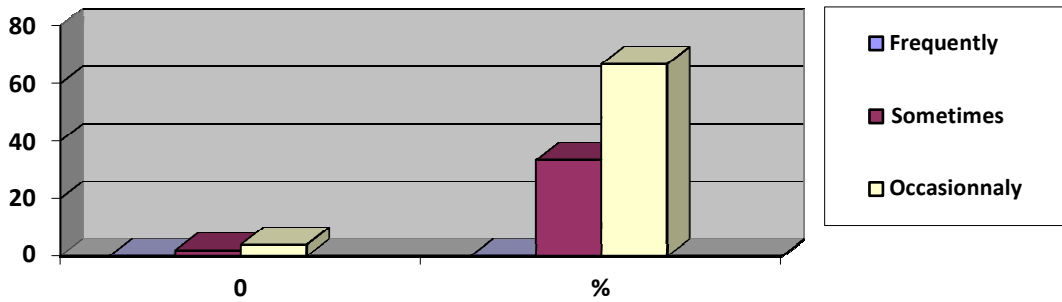
Table and figure (5.33) reveal that (66.66%) of the teachers expose occasionally their students to the translation of medical texts. (33.33%) of them expose sometimes their students to the translation of medical texts. No teacher seems to frequently expose his students to the translation of medical texts.

Question Seven

Does learners" experience in translation play a major role in his/ her success or failure in the translation of medical texts?

a) Yes

b) No

Please, justify your answer

Table 5.34: Learners' Experience in the Translation of Medical Texts

Suggestions	N°	%
a) Yes	14	93.33
b) No	1	6.66
Total	15	100

Figure 5.34: Learners' Experience in the Translation of Medical Texts
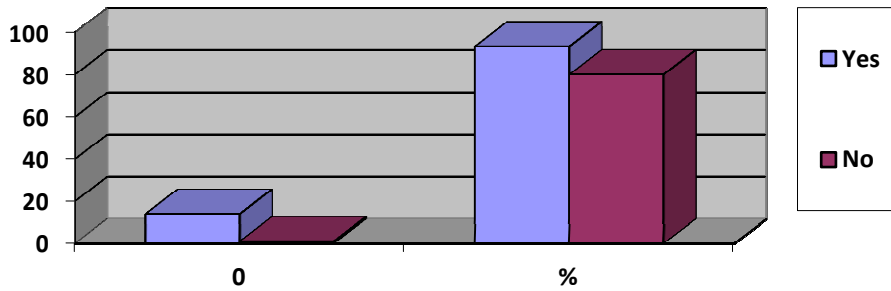
Table and figure (5.34) shows that most of the teachers (93.33%) consider experience as an important feature for an effective translation of medical texts. They consider that in order to produce a good translation, the translator must be able to thoroughly understand the text, not just produce a verbatim copy. Such deep understanding only comes with many years of experience. Only (6.66) % view experience secondary in achieving a good translation of medical texts.

Section Two: Teachers' Procedure in initiating Students to the Translation of Medical Text.

Question Eight

What kind of strategy do you use in the translation of medical Terms?

    a) Literal translation

    b) Loan translation

    c) Free translation

    d) Transliteration

    e) others

Please, justify your answer

Table 5.35: Strategy used in the Translation of Medical Terms

Suggestions	N°	%
a) Literal Translation	7	46.66
b) Loan Translation	2	13.33
c) Free Translation	1	6.66
d) Transliteration	4	26.66
e) Others	1	6.66
Total	15	100

Figure 5.35: Strategy Used in the Translation of Medical Terms
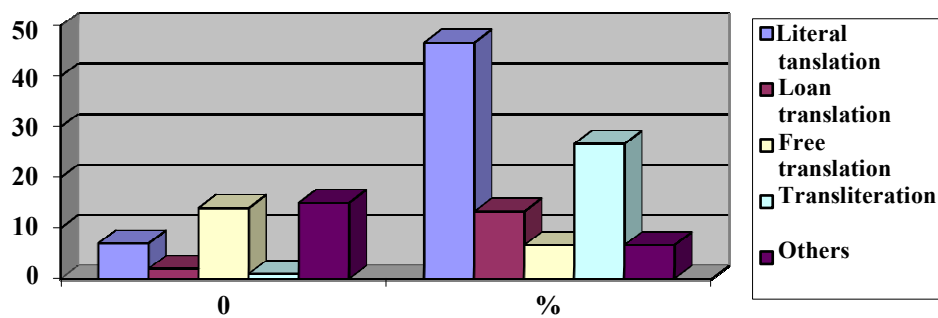
As indicated in table and figure (5.35), most teachers (46.66%) use literal translation strategy in the translation of medical terms. This can be explained by the prominent role of terminology in the translation of medical texts. (26%) of the teachers prefer to rely on transliteration strategy when there is no direct equivalent of the English medical term in the Arabic language. (13.33%) of them consider loan translation necessary when there is no equivalent in the target language. Only (6.66%) assume to use free translation in the translation of medical texts.

Question Nine

Which feature do you think students should focus on while translating medical texts?

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a) Context

b) Rhetoric

c) Vocabulary

d) Meaning

e) Equivalence

f) Grammar

g) Others

Table 5.36: Students' Feature Focus in the Translation of Medical Texts

Suggestions	N°	%
a) Context	1	6.66
b) Rhetoric	1	6.66
c) Vocabulary	6	40
d) Meaning	1	6.66
e) Equivalence	3	20
f) Grammar	3	20
g) Others	0	0
Total	15	100

Figure 5.36: Students' Feature Focus in the Translation of Medical Texts
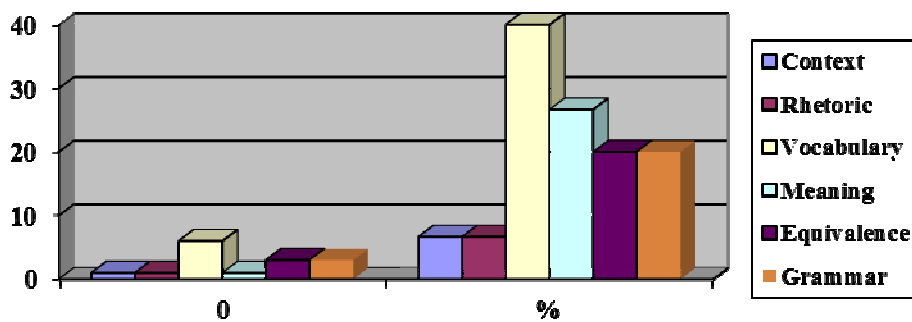
The above table and figure revealed that the majority of the teachers (40%) consider vocabulary as the most prominent feature in the translation of medical texts. (20%) of them give importance to equivalence. (20%) of the teachers regard grammar as an important feature without which meaning cannot be conveyed. (6.66%) view meaning important in the transmission of information. (6.66) regard context as an important feature in translation, and (6.66) view rhetoric important to the translation of medical texts. These answers stretch the importance of all these notions in the production of an efficient and reliable translation of medical texts.

Question Ten:

Translation is "the translation of meaning from the source language (SL) to the target language (TL)"; to what extent can this definition be applied to the translation of medical texts?

Regarding this question, teachers assume that the translation of meaning depends mainly on the type of text .In literary texts, for example, priority in given to style rather than terminology. However, in scientific texts priority would be given to terminology.

Question Eleven:

Which procedure do you use while introducing students to the translation of medical texts? Explain?

With regard to this question, the majority of the teachers assume that they devote time to reading the medical text, identifying and explaining the difficult words, constructing meaning about the text, then, translating the texts.

Question Twelve:

Do you think the student failure in translating medical texts is related to:

a) The specialised vocabulary

b) Finding equivalence between the SL and the TL

c) The mastery of the translation basics

d) The approach used in translation

Table 5.37: Students' Failure to Translate Medical Texts

Suggestions	N°	%
a) The Specialized Vocabulary	7	46.66
b) Finding equivalence between the SL and the TL	2	13.33
c) Mastery of the Translation Basics	1	6.66
d) The approach used in Translation	5	33.33
Total	15	100

Figure 5.37: Students' Failure to Translate Medical Texts
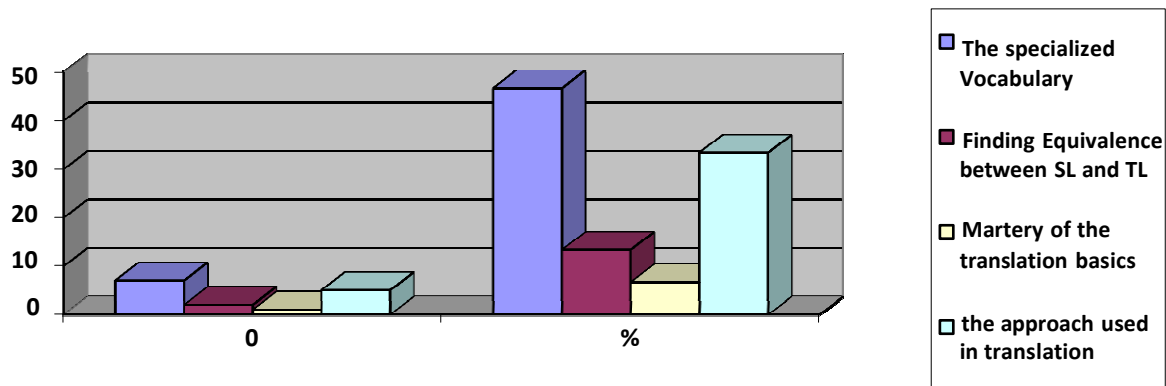
With regard to this question, we noticed that the majority of the teachers (46.66%) view the specialised vocabulary of medical texts problematic for learners who are not specialised in the scientific field. However, (33.33%) of them consider that students" failure in translating medical texts is related to the inadequate approach used in translation. (13.33%) of the teachers deem finding equivalent as one of the reasons related to the students" failure to

translate efficiently medical texts, and (6.66%) relate students" failure in translation medical texts to the mastery of translation basics.

Question Thirteen:

To what extent do you think that the translation of medical texts from English into Arabic is possible?

In relation to this question, the majority of the teachers" (80%) consider the translatability of medical texts closely related to the nature of the text and its audience. Purely scientific texts, for example, can be read and understood only by professional and, hence, can be translated only by professional scientific translators. Only a few teachers (20%) assume that there are other features like context which should be taken into consideration in the translation of medical texts.

Table 5.38: Translatability of Medical Texts from English into Arabic

Suggestions	N°	%
a) Yes	12	80
b) No	3	20
Total	15	100

Figure 5.38: Translatability of Medical Texts from English into Arabic

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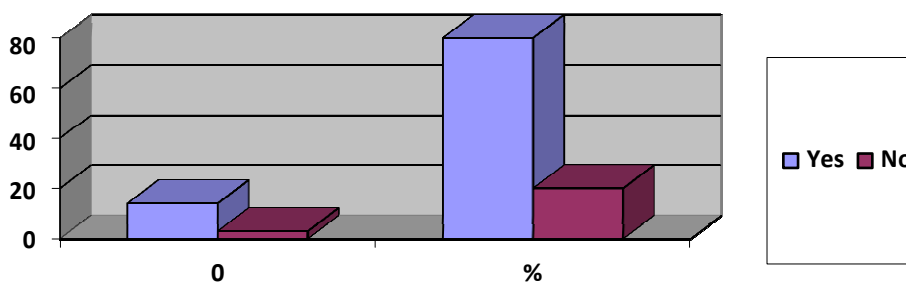
Question Fourteen:

How useful would a corpus or glossary of medical terminology be to your translation?

While attempting to answer this question, we noticed that (90.33%) of the teachers consider using a corpus of glossary of great importance in providing the students with the direct denotative meaning of words that will help them develop knowledge about the text. Only (6.66%) of them consider corpus glossary not necessary especially in the translation of literary texts.

Table 5.39: The Use of a Corpus or Glossary of Medical Terminology in Translation

Suggestions	N°	%
a) Yes	14	90.33
b) No	1	6.66
Total	15	100

Figure 5.39: The Use of a Corpus or Glossary of Medical Terminology in Translation
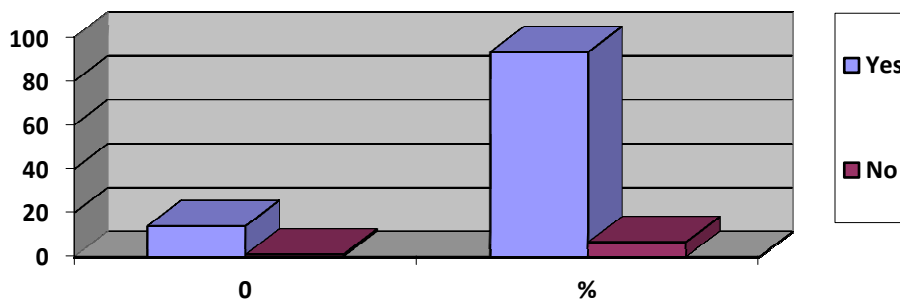
Question Fifteen:

Is it advisable to focus on "translating meaning" rather than "translating equivalence"?

    a) Yes

b) No

Justify your answer, please

Table 5.40: Translation Meaning versus Translation Equivalence

Suggestions	N°	%
a) Yes	10	66.66
b) No	5	33.33
Total	15	100

Figure 5.40: Translation Meaning versus Translation Equivalence
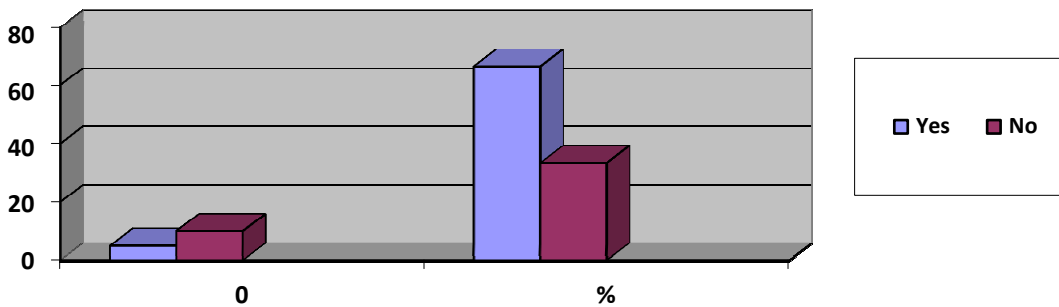
Table and figure (5.40) reveal that most teachers (66.66%) assume that translation of meaning can take place when dealing with literary texts where priority is given to style rather than terminology. However, (33.33%) of them consider that translation equivalence takes priority over translating meaning especially when dealing with scientific texts.

Question Sixteen

During learning, students face difficulties which may hamper their progress. As a teacher, what advice would you like to provide in order to help them improve their translation of medical   texts?

Regarding this question, most teachers (49%) agree on the fact that reading is the key solution to constructing knowledge, and building vocabulary especially when dealing with scientific texts where terminology is the key component. Others, (26%) consider that having a corpus of glossary and practising translations outside their syllabus program my help student improve their translation of medical texts. Yet, some (25%) teachers maintain that skills, interest and motivation are the most important features of an effective translation of medical texts.

Table 5.41: Teacher' Advice to Help Students Improve their Translation of Medical Texts

Suggestions	N°	%
a) Reading scientific and medical writings	7	46.66
b) Using a corpus dictionary and practising translation outside syllabus program	5	33.33
c) Skills, interest and motivation	3	20
Total	15	100

Figure 5.41: Teacher' Advice to Help Students Improve their Translation of Medical Texts
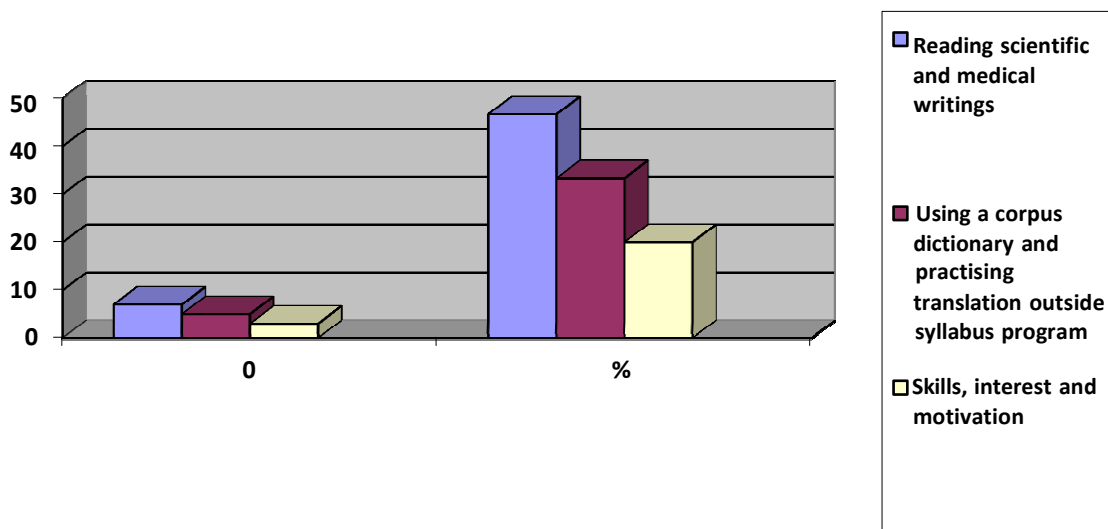
Section Three: Teachers' Views on Reading Comprehension

Question Seventeen:

Do you introduce your students to the notion of reading comprehension in translation classes?

a) Yes

b) No

Table 5.42: Students' Introduction to the Notion of Reading Comprehension

Suggestions	N°	%
a) Yes	12	80
b) No	3	20
Total	15	100

Figure 5.42: Students' Introduction to the Notion of Reading Comprehension
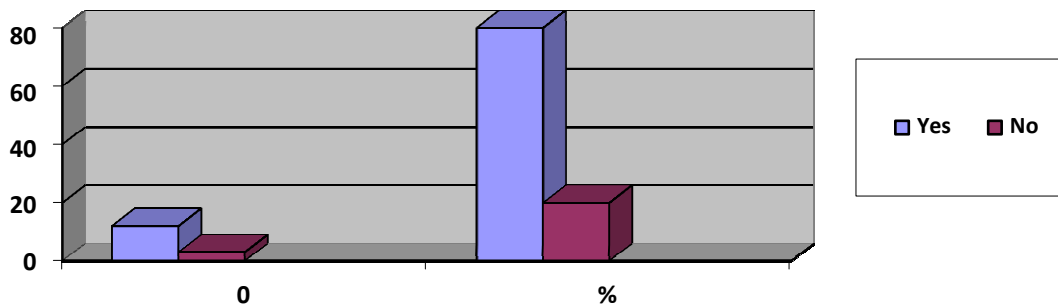
Table and figure (5.42) reveal that nearly all teachers (80%) assume to introduce their students to the notion of reading comprehension strategies in translation. Only (20%) of them do not focus on the notion of reading comprehension in translation.

Question Eighteen:

If your answer is yes, on which reading comprehension strategy do you focus more when you introduce students to the translation of medical texts?

a) Skimming and scanning

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b) Inferring

c) Guessing the meaning of new words

d) Self-monitoring

e) Summarising

f) Combining all of them

Table 5.43: Teachers' Use of Reading Comprehension Strategies

Suggestions	N°	%
a) Skimming and scanning	9	60
b) Inferring	2	13.33
c) Guessing the meaning of new words	0	0
d) Self-monitoring	1	6.66
e) Summarising	1	6.66
f) Combining all of them	2	13.33
Total	15	100

With regard to this question, we noticed that many teacher (60%) stretch students" intention to the importance of scanning and skimming texts in achieving a good translation of medical texts. (13%) of them focus on inferring meaning when translating medical texts. (6.66%) consider that self-monitoring may help students achieve a good translation of medical texts; while (6.66%) view summarising as a reading comprehension strategy that may help students grasp the overall meaning of texts. Yet, (13.33%) consider the combination of the different reading comprehension strategies crucial in the production of an effective translation of medical texts.

Figure 5.43: Teachers' Use of Reading Comprehension Strategies
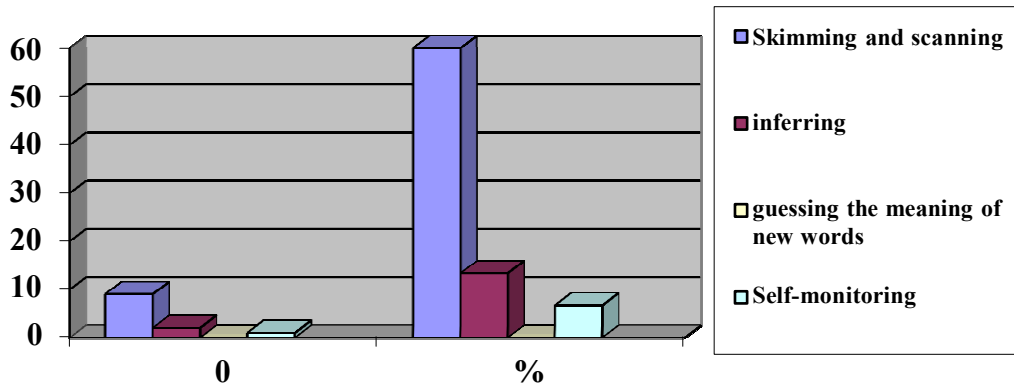
Question Nineteen:

Do you think that teaching reading comprehension strategies may help students improve their translation of medical texts?

Table 5.44: Using Reading Comprehension Strategies in Scientific Texts

Suggestions	N°	%
a) Yes	13	86.66
b) No	2	13.33
Total	15	100

Figure 5.44: Using Reading Comprehension Strategies in Scientific Texts
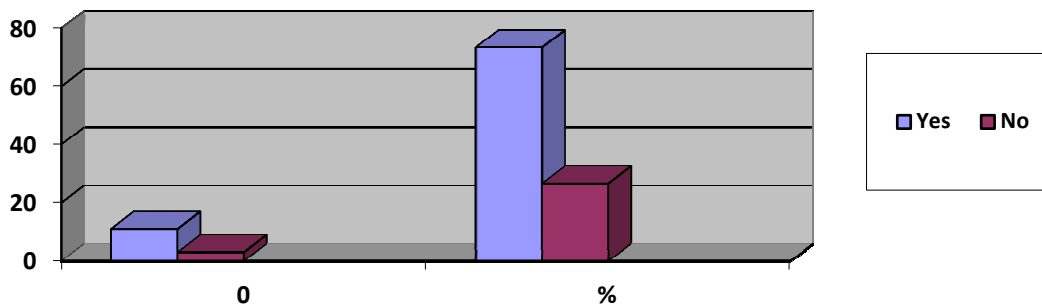
With regard to this question, we noticed that the majority of teacher (86.66%) view teaching reading comprehension as an important step in initiating students to the translation of scientific and medical texts. Only (13.33%) consider that there are other important features such as terminology which is crucial in the translation of medical texts and without which translation cannot be efficiently achieved

Question Twenty:

Do you think that teaching reading strategies may help students to achieve reading comprehension during their study?

      a) Yes

      b) No

Table 5.45: Teaching Reading Comprehension

Suggestions	N°	%
a) Yes	12	80
b) No	3	20
Total	15	100

Figure Twenty 5.45: Teaching Reading Comprehension
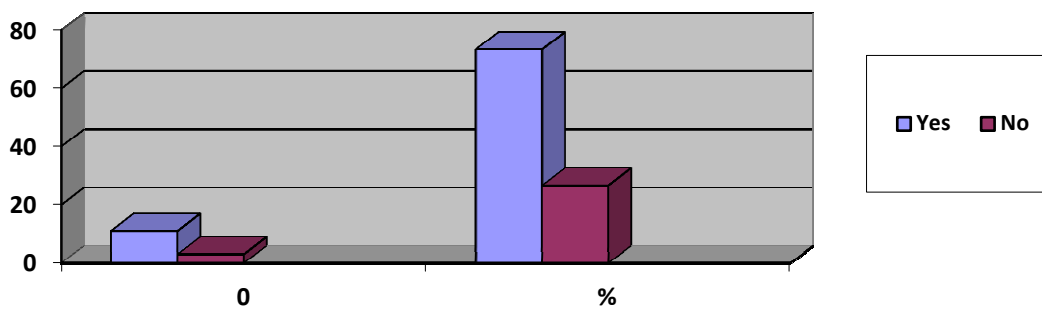
From Table and figure (5.45), we notice that (80%) of the teachers argue that teaching students reading strategies will always help them both to be good readers and to solve problems in reading. Yet, (20%) of them consider that there are other features such as terminology that are crucial to the comprehension of medical texts.

5.2.2. Discussion of the Teachers Questionnaire Results

The analysis of teachers" questionnaire yielded significant data regarding their perceptions, attitudes, and work in translation classes as follows:

- Teachers adopt their courses according the needs of the students. This entails the corporation of the students to show interest and motivation in the learning process
- Teachers" design of courses depends on the course syllabus.
- Teachers need to implement activities that may help students construct vocabulary.
- Teachers need to focus on students" pitfalls to enhance their translation of medical texts.
- Teachers need to initiate students to scientific and medical translation in their courses syllabus.
- Teachers have to initiate their students to the reading comprehension strategies to improve their translation of medical texts.
- Teachers have to motivate their students to the use of reading comprehension strategies.

Conclusion

By and large, the result of the analysis we inferred from the teachers "questionnaire revealed that teachers of translation devote a considerable time of their lectures to introduce students to the most important notions related to translation. Some of these notions are closely

related to the importance of using reading comprehension strategies in achieving a good comprehension of medical texts. Others are related to the importance using them appropriately to achieve a good translation of medical texts.

On the other hand, the students" questionnaire analysis displayed that, generally, students are aware of the importance of reading comprehension strategies in building comprehension of a text. Yet they do not use these strategies appropriately in the translation of medical texts. They rather prefer to focus on the translations of the specialized terminology.

CHAPTER SIX

Research Design and Data Analysis

CHAPTER SIX

Experimental Research and Data Analysis

Introduction

An experimental research is defined as a systematic and scientific approach to research in which the researcher employs one or more variables, then, controls and measures any change in other variables. Any successful experimental research needs to be prepared on basis of stating hypothesis and research question, selecting a suitable sample of population, using the appropriate tools to collect data and following a well-organized statistical procedure to analyse it. Accordingly, the present chapter tends to present a research design implemented to test our hypothesis and research questions. It aims to exhibit the difficulties encountered by first year master students in the translation of medical texts and to display the importance of using reading comprehension strategies to overcome these problems and to achieve a good translation of medical texts. The chapter offers first a description of the research design, the chosen population and the target investigation. Then, the chapter displays the materials used for the treatment and data collection, and describes the procedure used for the data collection.

6.1. Research design

The present research is conducted according to the questionnaires. It exhibits a study of an experimental method which has its main targets, first, the identification of the difficulties encountered by first year master students in the translation of medical texts and the terminological problems they encounter while rendering an English medical text into its Arabic equivalent. Second, it aims to examine of the role of using reading comprehension strategies in providing the students with a good comprehension of medical texts that will help them achieve an efficient translation of it. In this investigation, two variables are taken into consideration: Independent variable (using reading comprehension strategies in translation),

dependent variable (problems in translating medical texts). As for this latter, we explored how can reading comprehension strategies improve students' translation of medical texts. In this respect, our research relies on Pre-post-test comparison. The comparison is made between the students' translations before the experiment and after it.

6.1.2. Population and Random Sampling

In the present research, the population of interest comprises first year master students of English at the department of English, faculty of Letters end English Language, University of Frères Mentouri, Constantine. The selected population is, primarily, based on the fact that students at this level have a fairly good command of English after 3 years of intensive study. Added to this, they studied ESP for two years while they were preparing their (licence degree). Also, they studied EST for one year, and practiced translation for two years.

Thanks to the help and cooperation of a Teacher of translation, fifty students (50) were randomly chosen from a population of seventy two students taken randomly from two different groups. The students were asked first, to translate a medical text which represents the (Pre-test). Then, a course design was established with the same sample. The course design consisted of establishing Lectures in which different reading comprehension strategies were introduced to students. After that, in another session, students were asked to translate a medical text for the post-test analysis.

6.1.3. Target Investigation

The present work is mainly concerned with the analysis of the students' difficulties in the translation of medical texts. It stretches the efficiency of using reading comprehension strategies in understanding medical texts and producing a good translation of it. As such, the research exhibit different terminological problems faced by the students in the process of

translating medical texts. It also elicits the most frequent strategies used by the students in the translation of medical texts, and then it introduces different reading comprehension strategies and evaluates the students' use of these strategies in understanding the medical text and producing a good translation of it.

6.1.4. Instruments and Data Collection

6.2. Pre-Test:

6.2.1. Description of the Pre-Test

To examine the students' translation of English medical texts into Arabic, an English Medical text was administered to a group of fifty (50) Master students, taken from the English department at the University of Frère Mentouri, Constantine, to be translated into Arabic. The purpose of this test is to depict the students' translation of a medical text, and to elicit the terminological difficulties encountered in their translation. In addition, the test attempts to portray the main students' strategies used in the translation of the medical text. The test was taken at the beginning of the first semester before introducing the concept of reading comprehension strategies.

6.2.2 Nature of the Pre-test

The title of the medical text is: "Functions of the Human Body" taken from the book "Beginning Scientific English" written by D.E. Royds Irmak. It has deliberately been chosen for the following reasons:

a) The Students are familiar with this type of texts during their academic studies, especially in EST sessions.

b)   It is of a fair length (270 words) to suit the allocated time.

c) The passage is rather interesting for the testing students as they have to deal with its translation requirements, especially in matters like (successful translation, unacceptable translation, under translation, over translation…etc.)

6.2.3. Analysis of the Pre-Test

The analysis of the students' revealed that numerous translation strategies were adopted by first year master students of English

1. Literal translation also called word for word translation: It is used when each English term has an equivalent term in Arabic. Usually English-Arabic dictionaries and CAT tools are helpful in this case.

2. Transliteration: It refers to the transliteration of an English term that has an already existing equivalent in Arabic which is more transparent than its proposed transliterated form. In other words, transliteration can be explained as the English word written in Arabic script**.**

4. Explanation / Paraphrasing: This strategy was used in translating some terms. It involves giving an explanation of the term instead of providing the TL equivalent.

5. Omission: It means leaving out one or more of the elements of the SL compound without including them in the target translation.

6. Translation by a More General Word (Superordinate): This strategy could be used when the subjects understood only the core element of the term and rendered it into Arabic and ignoring the other element of the word.

7. Transposition: Transposition refers to the change of one part of speech for another without changing the sense. It is in a sense a shift of word class. Vinay and Darbelnet

(1995:94) see transposition as "probably the most common structural change undertaken by translators".

All these strategies are essential at various times when dealing with various texts. However, scientific translation requires a particular attention especially when dealing with terminology which can be problematic to the target language. From the given examples, it can be noticed that some students succeeded in obtaining the correct translation by using the already mentioned strategies and some failed, as the cited strategies may work in the translation of some terms but do not give accurate translations in other cases. The analysis of the students' translation revealed the following:

<u>Successful Translations</u>

Table 6.1: Evaluation of the Students' Translation of the Term "**internal organs**"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		حُەُخاد ءاعأ	49	
2	**Internal organs**	No equivalent given	1	تُەخاد ءاضعأ

It can be noticed, here, that nearly all the students (49) translated successfully the term **internal organs** into the Arabic term داخُەت أعضاء. Only one (1) student failed in translating the English medical term, so he omitted the word from the original text. This procedure is called "the avoidance strategy". Further, we observed that in item (1) students changed the words order in the target translation from (Adjective-Noun) to (Noun-Adjective) without altering the meaning. This translation strategy is called "transposition" or "shift". It consists at changing the word class without changing the meaning." Newmark

(1988) argues that transposition consists of four types of grammatical changes. The first type concerns words' form and position.

The same successful translation is observed in the term "**Respiratory system**" as follows

Table 6.2: Evaluation of the Students' Translation of the Term "Respiratory System"

Item N	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1	**Respiratory system**	زاهجنا يسفُنُنا No equivalent given	50 0	يسفُنُا زاهجنا

Table (6.2) shows that all students (50) succeeded in translating the English term **respiratory system** into the Arabic term **زاهجنا يسفُنُا** as a unique available translation. Also, this translation highlights the students' use of transposition which is described as a shift of word class without changing the sense. Vinay and Darbelnet (1995:94) see transposition as "probably the most common structural change undertaken by translators". The transposition here is from (adjective-noun) to (noun-adjective).

Another example of successful translation is in the term **"Digestive System"**

Table 6.3: Evaluation of the Students' Translation of the Term "Digestive System"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1	**Digestive system**	زاهجنا يمَضُعنا No equivalent given	50 0	يمَضُهنا زاهجنا

As can be noticed in the above table (6.3), all students (50) translated successfully the term digestive system into الجهاز الهَضْمِي. In addition, this translation displays the students' transposition of the word class from (adjective- Noun) **Digestive system** into (noun-adjective) الهَضْمِي الجهاز.

One more example of the students' successful translation is exhibited in the term **The nervous system.**

Table 6.4: Evaluation of the Students' Translation of the Term "Nervous System"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1	**The nervous system**	الجهاز العَصَبِي No equivalent given	27 3	الجهاز العَصَبِي

We notice from the above table that the majority of the students succeeded in making a good translation of the term **Nervous system** by finding the exact Arabic Equivalent الجهاز العَصَبِي. Only three students failed to find the Arabic Equivalent and opted for the avoidance strategy, so they omitted the English word from their Arabic translation. In addition, we observed that students transposed the words order of the English medical term **Nervous system** (adjective-noun) into the Arabic medical term العَصَبِي الجهاز (noun-adjective).

The same success is observed in the translation of the word **"lungs"**

Table 6.5: Evaluation of the Students' Translation of the Term "Lungs"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1	**The lungs**	الرِئُتَيْن	27	الرِئَتَيْن
		No equivalent given	3	

As can be observed in the above table, nearly all students (27) provided a successful literal or direct translation of the English word **lungs** into the Arabic term الرِئَتَيْن. Only three (3) students failed to find the exact Arabic equivalent of the term. As a result they opted for the avoidance strategy.

Literal or direct translation procedures are used when structural and conceptual elements of the source language can be transposed into the target language. Vinay and Darbelnet (2000:84) says that "In some translation task it may be possible to transpose the source language message element by element into the target language, because it is based on either parallel categories, in which case we can speak of structural parallelism, or on parallel concepts, which are the result of metalinguistic parallelism".

Unacceptable translations

The following translations are counted as unacceptable translations (according to the official Translations, medical dictionaries and websites. It is generally used when the respondents fail to grasp the meaning of the item and provided an inappropriate translation of it. It is also used to refer to uncommon transliterations or Arabizations that do not exist in the Arabic language for the terms which already have Arabic equivalents.

An example of unacceptable translation is illustrated in the translation of the **"moves around the body"**

Table 6.6: Evaluation of the translation of the expression "moves around the body"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		روذ لبح ئسجنا	11	
2		ءاسجأ كفنئَ سجنا نِ عُ َّج ءاحَ أ ئسجنا	4	
3	**moves around the body**	ِشنَةَ سجنا لبح نرحتَنِ مك ءسج ِي	8	روذَ لبح ئسجنا
4		روذَ نِ سجنا ميِاك	9	
5		ممنُئَةَ لبح ئسجنا	6	
6		No equivalent given	12	
7			0	

Table (6.4) reveals that students supplied different translations of the English expression **moves around the body.** While (11) students translated successfully the English expression into: ئسجنا لبح روذَ . Many of them (9) mistranslated it into ئسجنا لبح ِشنَةَ. Others (8) under translated it into سجنا نِتَحتَنر. Further, (4) Students over translated the expression into: ئسجنا ءاسجأ ِي ءسج مك نِتَحتَنر and (6) of them translated it into ئسجنا ميِاك نِ ذَ روذَ. The different translations supplied by the students reveal that in items 1, 3,4,5,6 the students presented a literal translation, whereas in item 2 students paraphrased the expression.

Another example of unacceptable translation is exhibited in the term "Skeleton"

Table 6.7: Evaluation of the Students' Translation of the Term "Skeleton".

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		عِظَمٌ هيكُمُ	28	
2	**Skeleton**	العِظاَمُ هجاز	10	
3		العَمرُ العَظَمِىُ	3	العِظَم هيكُمُ
4		العِهكُمُ العجهاز	4	
5		العِهكُمُ العظاو	1	
6		سِهكِم	3	
7		No equivalent given	1	

It is worth noting here, that (28) students presented a successful translation of the term **Skeleton** as illustrated in item (1) and (4). Indeed, (28) students translated the word Skeleton as عِظَمٌ هيكُم and four (4) students translated it as, العِهكُمُ العجهاز. The other students failed in their translation since in item (3), the translation العَمرُ العَظَمِى refers to the English word **Backbone.** In item (6) the term is transliterated into سِهكِم. In item (7), no answer is given to the term. This strategy is called the "avoidance strategy".

Another example of the unacceptable translation can be seen in the translation of the term "**Circulatory system**":

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Table 6.8: Evaluation of the Students' Translation of the Term "Circulatory System"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		النظام الوظيفي الندوري	7	
2		النظام الدوري جهاز	5	
3		النظام الدوري الوظيفي	13	
4	Circulatory system	جهاز دوري الدني	18	النظام الدوري الوظيفي
5		النظام الدوري جهاز	3	
6		النظام المال الجهازي	1	
7		النظام الجماعي	1	
8		النجماع النحركي	1	
9		No equivalent given	1	

Table (6.6) shows that many students presented an unacceptable translation of the term **circulatory system** as illustrated in items 2, 6, 7, 8. Also, it is worth noting, here, that most of the students produced a literal translation of the term **circulatory** which resulted in different translations like النحركي, الندوري , النمال, النددوري, النددوري . Only one student omitted the term from the original text, as can be seen in item (9). We also noticed that (7) students ended up with a successful translation of the English term **Circulatory system** as illustrated in item (1) النظام الدوري الوظيفي. We also observed that some students translated the English term in a definite and in an indefinite way as in item (1), (4) and (5) النظام الوظيفي جهاز دوري الدني and النددوري النظام, النددوري النظام. Finally, thirteen students (13) under translated the term by providing the Arabic

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literal translation **النوروة جهاز** which refers to any circulatory system instead of the Arabic term النّبَين النّدورة جهاز.

The same problem of under translation can be noticed in the following translation:

Table 6.9: Evaluation of the Translation of the Expression "Take Oxygen into the Blood"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		إنّنا وذنا أخذَ الأكسجينُ	20	
2		وننا اخدا الأكسجينُ إنّه	7	
3	**Take oxygen into the blood**	غثنزذنا وهناءا انجسئةَرَر	3	الأكسجينُ مَمَ انجسى إنَّه
4		مَمَ الأكسجينُ إنّه	9	
5		انجسى كايم لحد دوارّ الأكسجينُ	5	
6		وننا إجَاجا الأكسجينُ إنّه	2	
7		إن وذنا عثء الأكسجينُ	3	
8		No equivalent given	1	

A glance at table (6.7) enables us to notice that the students ended up with different literal translations as in items 1, 2, 3, 4, 5, 6 and 7 أخذَ, ادخالا,رَرةَ, رَرةَ, مَم, اروذّ, إجَاجَ, ثعب. It can be noticed that the students' literal translation is based on the meaning of the word **Take.** It can also be observed that in item (3) the word **oxygen** is translated into Arabic term هناءا

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which is a general translation to the English term. Also, we observed that students supplied different translation of the preposition **into**. Some of them translated it into the Arabic term إِنَّا as exhibited in items 1, 2, 4, 6 while others translated it into the Arabic terms إِنَّ حِيَلِ, رِبع as illustrated in items 3, 5, 7.

The same problem is observed in the translation of the term "**Support the Body**" which received 7, different translations.

Table 6.10: Evaluation of the Translation of the Expression "Support the Body"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		انجسى ذعى	22	
2		تلاحى انجس	9	
3		تشكُلم انجس	10	
4	**Support the body**	تشجع انجس	2	ذعب انجسى
5		تمىَّح انجس	2	
6		إسُّاد انجسى	4	
7		انجسى إعاجح	1	
8		No equivalent given	0	

The above table shows that in items1, 2, 3, 4, 5, 6, 7, the English expression **Support** is translated into the Arabic terms: تعذى, تلاحى , مكشت, تشجع , تمىَّت, إسُّاد, إعاتن . The notion of

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genie is also taken differently by some of the students as in item 1, 3, ‎نَذَ، ثكلَ،تشجع‎ .The different translations supplied by the students highlight the fact that students failed to understand the context in which the term **support** has been used. This is reflected in item 3, 4, 5 and 7 where the English term **support** has been used out of its context.

Other strategies were observed in the students' translation of the medical text such as, paraphrasing. Nevertheless, the rendering is not always fruitful as in the following example:

Table 6.11: Evaluation of the Students' Translation of the Expression "Waste matter is dejected from the body"

Item No	The English expression	The Translated Forms	No. Of Occurr ences	Suggested Translations
1		‎يِ ٱنجس ٱعَنا خلاَ طُرِ‎	14	
2		‎انجسِ يِ ٱنظِفُرَ حِ ٱنجسِةا ٱعَنا خلا‎	4	
3		‎يِ جرخت ٱنفعاَلخ يِ ٱنجسك م‎	10	
4	**Waste matter is dejected from the body**	‎انا عَنا خلا يٰ ٱنجدجترِبي ٱلفراز اخ‎	8	‎ٱنفضالث يِطُرِ يِ ٱنجسِ‎
5		‎يِ انجسِ يُتَنخصهص نِ‎	7	
		‎خ اراج انجسِ ئُممم عَنا خلا‎		
6		No equivalent given	3	
7			4	

The above table shows that different translations were supplied by the students to the clause **Waste matter is dejected from the body**. Some of the students translated the term **Waste Matter** into ‎ٱنفضالث‎ as in items 1, 2,3,4,6 while others translated it into ‎ٱلفرازاخ‎ as in

item (5). In addition, we noticed that numerous translations were given by the students to the

term **"dejected"** as: اَنرنِفظح ,تخرج , خهَص, خارج هُمم, تِروُ .

Table 6.12: Evaluation of the Translation of the Term "Urinary System"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		اجهازانثُنيِ	36	
2	**Urinary system**	اجهاز انيثُيِ	2	اجهازانبنِ
3		انطرح ظاو	1	
4		انعالخ اجهازغرح	1	
5		انشِ انُظاو	4	
6		جهازانطرح	5	
7		No equivalent given	1	

The above table displays different translations given by the students to the English

term **Urinary System**. This difference highlights student' confusion about the right

equivalent to be given to the original medical term. Although, many students succeeded in

finding the exact Arabic equivalent, اجهازانبنِ, of the English medical term, **Urinary**

system, as illustrated in item (1), some of them faced hard hurl difficulties in finding the

adequate Arabic equivalent as can be seen in items 2, 3, 4, 5, 6. انبنِ اجهاز, انطرح ظاو,

انضافثلاط حرط اجهاز, انبنِ انُظاو, انطرح جهاز. The different translations supplied by the students

demonstrates students unsuccessful attempts to paraphrase the English medical term as in

items (3), (4), (6). One student opted for the avoidance strategy.

The same problem has been observed in the translation of the term **Endocrine System** as in the following:

Table 6.13: Evaluation of the Translation of the Term "Endocrine System"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		الغُدد الصماء	15	
2		الغُدد الصماء	12	
3	Endocrine system	الغدد الدرنيُ	3	الغدد الصماء
4		جهاز الغدد جهاز	8	
5		الأجزاء الهرمونيُ	2	
6		No equivalent given	10	

As presented in the above table, different translations are supplied to the word **Endocrine system** like الغُدد الصماء, جهاز الغدد الصماء, الغدد الدرنيُ الصماء, جهاز الغدد جهاز, الأجزاء الهرمونيُ . It can be noticed that all of the students failed to find in their Arabic vocabulary the exact and accurate translation of the English medical term. Further, ten (10) students expressed their ignorance by omitting the word from the original text as exhibited in item (6).

Among the students' problems in translating medical terms, the problem of Transliteration as follows:

Table 6.14: Evaluation of the Students' Translation of the Term "Thyroid"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		حُلرننا جذغنا	16	
2	**Thyroid**	ذَورُنُنا	20	حُلرننا جذغنا
3		No equivalent given	14	

The above table shows that the term **Thyroid** is transliterated by many students into ذَوَورُنُنا. This translation proves students' problems in finding the adequate Arabic equivalent of the term. Also, a large number of students failed to find the exact equivalent of the word **thyroid**, so, they opted for avoidance strategy as exhibited in item (3) where (14) students omitted the term **thyroid** from the original text. Only sixteen (16) translated successfully the English term **Thyroid** into its Arabic equivalent تُلرننا قذغنا.

The same problem is illustrated in the following example:

Table 6.15: Evaluation of the Students' Translation of the Term "Adrenal Gland"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		أألدرَرَفُناُنِ جذغ	29	
2	**Adrenal Glands**	جذغنا حَرظكنا	14	دذغنا حَرظكنا
3		No equivalent given	7	

The above table displays students' intricacies to find the Arabic equivalent of the English medical term **Adrenal Glands.** It reveals that the majority of the students (29) transliterated the English term **Adrenal** into the Arabic term الأدرَينُالِ. Further, the students' translations exhibit a transposition of the English term (Adjective-Noun) into the Arabic term (Noun- Adjective). Also, the table reveals students' lack of the specialized vocabulary that characterizes medical texts in both English and Arabic. This is reflected in item (2) where only fourteen (14) students provided a successful translation of the English medical term.

Similarity, the word **hormones** is translated as follows:

Table 6.16: Evaluation of the Students' Translation of the Term "Hormones"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		خأىيرهنا	45	
2	**Hormones**	No equivalent given	5	خأىيرهنا

It is worth noting, here, that nearly all students failed to find in the Arabic language the equivalent of the English word **Hormones.** So, they transliterated it as illustrated in item (1), other students expressed their ignorance by omitting the word from the original text as can be seen in item (2).

6.2.4. Overall analysis

The analysis of students' pre-test revealed that students face hard hurl difficulties to translate medical texts from English into Arabic. It indicated that students' main problem in the translation of medical texts is related to the specialized terminology. Also, the analysis displayed that numerous translation strategies were adopted by first year master students of English. The most dominant strategies are literal and transliteral procedures in translation. Further, the analysis demonstrated that some students transposed terms while others provided a general translation of words. Some of them opted for the avoidance strategy whenever they feel any difficulty in finding in the Arabic language the corresponding term. Hence, it becomes evident that students need to follow a specific approach that will help them improve their translation of medical terms.

6.3. Implementation Course Design

Previous studies have shown that students' performance can be improved by following certain strategies and that the appropriate use of strategies enables learners to learn effectively (O'Malley and Chamot, 1990). On the other hand, scientific texts, in general, and medical texts, in particular unlike the other types of texts, contain unfamiliar content and text structures, heavy conceptual demands, and specific vocabulary. The purpose of scientific and medical texts is to help the reader construct meaning about specific scientific ideas with expository and interrelated words sentences. Hence, reading scientific texts, in general, and medical texts, in particular is not simply a bottom-up or a top-down process. Rather, it is an interactive and constructive process that involves building meaning by "negotiating understanding between the text and the reader's concurrent experiences and memories of the topic within a sociocultural context" (Yore and Shymansky, 1991: 29-36). Additionally, the translators are, in fact, mediators between the source and the target languages. They are considered as "privileged readers" of the source language text (ibid).

Furthermore, as reading comprehension becomes a crucial part dealt with during the process of translation, the translator has no other choice rather than reading the texts, no matter how at the micro or macro levels it is. Séguinot (1989:21-53) states explicitly that reading a source text may not be translation-specific, but that translation includes the reading of the source text, sharing the view that translation includes not only translation-specific operations, but also others such as reading a source text. Similarly, Le Feal (1988: 205-212) considers reading as a precondition to translation, pointing out that translation in practical terms implies intelligent reading followed by competent writing especially in the medical field. It is assumed that a problematic product of translation is the result of what is called "mall-processed" translation. According to Li (2001:344) "the translator trainers tend to forget that language competence is the most fundamental and the most important among the three components of translational competence (i.e. translation skills, strategies and translation problem solving and decision-making abilities). While dealing with the elements involved in the process of translation, different issues must be taken into observation. In the same line of thought Ivanova (1998: 98) notes: "most recent findings of research into language learners' translation strategies point to one major feature of their processing: language students tend to engage primarily in lower level processing during comprehension, translation production and monitoring".

In this respect, we attempted in this study to implement a course design to draw the students' attention to the importance of using reading comprehension strategies to enhance students' understanding of the source medical texts and the acquisition of the necessary vocabulary needed for translation. For this sake, some reading comprehension strategies are introduced   to   students.

6.3.1. Description of the Course Design

In the pre- test, we observed that students face harsh difficulties in the translation of medical texts from English into Arabic. This difficulty stems largely from the students' incompetence in translating medical terms and the inability to comprehend all the specific term of the text. As a result, most of the students ended up with a poor transliteration of the text. Additionally, other students preferred to rely on the avoidance strategy. In this framework, the course material is directed to a group first year master students of English at the department of foreign languages, at the University of Frère Mentouri, Constantine. The course consists of three main stages:

Stage One

During the first stage, we introduced the students to the notion of reading. We asked them about the first thing they do when they are asked to translate and the different strategies they follow in the translation of scientific and medical texts. Then, the notions of comprehension and reading comprehension strategies were introduced to them.

Stage Two

After this stage, we introduced the students to the different reading comprehension strategies. Also, we stretched the student's attention to the importance of reading comprehension strategies in building knowledge about the source text material and its importance in providing the reader with an efficient rendering of the source medical text. Furthermore, we highlighted the importance of identifying all the aspects of the material to be read (vocabulary, sentence structure, style).The reading comprehension strategies initiated in the course comprise:

✔ **Introducing the students to the notion of predicting while reading texts** which involves thinking ahead while reading and anticipating information and events in the text.

✔ **Introducing the students the notion of skimming texts** in which students learn how to:

1) Use of quick glance through the text. 2) Notice the titles and headings and subheadings. 3) Read the opening sentence and the conclusion carefully. 4) Read the first and the last sentence of each paragraph in order to gain the main idea of the main points.

✔ **Introducing the notion of scanning texts in** which students read fastly and intelligently by capturing some important aspects and draw inferences from texts

✔ **Introducing the students to the notion of inferring meaning from texts** as the conclusions that they can draw about the unsaid passage based on what is actually said by the author. This strategy is well described by Zimmermann (2009:93) who said: "Drawing inferences from text is a technique which requires readers to use their prior knowledge (schema) and textual information to draw conclusions, make critical judgments, and form unique interpretations from text".

✔ **Introducing the students to the notion of guessing the Meaning of New Words** in which the students learn to (1) Guess the meaning of the text which surrounds it. (2) Understand the way words are formed. (3) Taking into consideration previous background knowledge of the students about the subject.

✔ **Introducing the students to the notion of self-monitoring in** which the students learn to be self-dependent.

✔ **Introducing the students to the notion of Summarizing** which consists at restating the information or the main ideas of a given text by the use of the students own style after their comprehension or in other words, taking a lot of information and creating a condensed version that covers only the main points

✔ **Providing the students with a medical text book material to be read** with the use of the initiated reading comprehend strategies.

Stage Three

This stage comprises a post- test. It consists at producing a preliminary translation of a medical text, then, exchanging the preliminary translation for a proof reading. The last part consists of a production of a final translation of the medical text.

6.4 Post-Test

As formally mentioned, the post-test analysis aims at identifying the students' difficulties in translating a medical text after initiating them to the use of reading comprehension strategies to improve comprehension of medical texts. The test occurred in the same conditions apropos of time, place and the nature of task performed as in the pre-test. The results are then compared to their pre-test performance to look for any significant changes or improvements in terms of difficulties encountered in translation to confirm or reject, by then, our stated hypothesis.

6.4.1 Description of the Post-Test

For our analysis, The Post-test was administered to the same group of 50 Master students, taken from the English department at the University of Frères Mentouri, Constantine.

6.4.1.1 Nature of the Post-Test

The title of the medical text is: **"Gastrites"** written by D.E. Royds Irmak. It has deliberately been chosen for the following reasons:

a)   The Students are familiar with this type of texts during their academic studies, especially in EST sessions.

b)   It is of a fair length (270 words) to suit the allocated time.

c)   The passage is rather interesting for the testing students as they have to deal with its translation requirements, especially in matters like (complete translation, under translation, over translation..etc.)

6.4.1.2. Analysis of Post-test

The analysis of the post test revealed that the students responded positively to the use of reading comprehension strategies in translation. This result is obtained from the different students' translation of the medical text.

<u>Successful Translation</u>

Table 6.17: Evaluation of the Students Translation of the Term "Gastritis"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		باهِتنا إعذًا	45	
2	**Gastritis**	قرحت جذعًنا	5	**باهِتنا قذعًنا**

The above table revealed that nearly all the students succeeded in finding the Arabic corresponding term to the English word **Gastritis** as illustrated in item (1) **باهِتنا قذعًنا**. Only five (5) students came with a wrong translation of the term as in item (2) **قذعًنا قرحن.**

This result can be justified by the fact that using reading comprehension strategies helps in the understanding of the source medical texts. Further, the students' use to the proofreading strategy helps them link the previous information with new one, then, produce a   final   translation   of   the   term.

Another example of successful translation is in the word **Mastication**

Table 6.18: Evaluation of the Students' Translation of the Term "Mastication"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		غَعَّنا	48	
2	Mastication	No equivalent given	2	غضي

It is worth noting, here, that nearly all the students succeeded in finding the equivalent of the word **Mastication** into the Arabic word غَضْنا. Only two students failed in finding the adequate equivalent of the word and omitted the word from the original text, as illustrated in item 2.

Also the word **Hiccough** has been translated successfully by the students as follows:

Table 6.19: Evaluation of the students' translation of the word "Hiccough"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		فَنايقا	25	
2	Hiccough	حازولح	18	قانفائا
		No equivalent given	7	

In the above table, we can notice that the majority of the students of item 2 translated the term **hiccough** into the Arabic equivalent حازول . It can be observed also that 18 students translated the term into فئاقةas can be seen in item1. Only 7 students preferred to omit the word and provide no translation of it. The successful result of the students' translation of this term can be justified by the fact that the use of reading comprehension strategies enhances their comprehension of the text, and exchanging papers for proofreading improves the selection of the most adequate Arabic equivalent.

Table 6.20: Evaluation of the Students' Translation of the Term "Inflammation"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		إحتراق	8	
2	**Inflamation**	حروق	13	باهتنا
3		حرلا	27	حرلات
4		باهتنا	2	
5		No equivalent given	0	

Table (6.20) revealed that the majority of the student Found the Arabic equivalent of the word **Inflamation** as ca be seen in item (3) and where (27) students translated it as حرلات, Two students preferred to translate the term into باهتنا . The problem located in this translation is related the singular and the plural as can be seen in items, (2), and (3). In item 2, students translated the term in its plural form حروق where as in item (3) the students translated the term in its singular form حرلات.

Another example is reflected in the translation of the term membrane **Mucus Membrane**

Table 6.21: Evaluation of the Students' Translation of the Term "Mucous Membrane"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		الغِشاءُ المُخاطِيُّ	30	
2	**Mucous Membrane**	ميوكُس ميمبرَينِ	18	الغِشاءُ المُخاطِيُّ
3		No equivalent given	2	

It can be observed from the above table that the majority of the students translated the term **mucous membrane** into الغِشاءُ المُخاطِيُّ as illustrated in item (1). However some

students failed in finding the exact meaning of the term, so they transliterated the word into **ميوكُس ميمبرَينِ** as can be seen in item (2). Others were unable to use any of the different

translation strategies; as a result, they opted for the avoidance strategy.

Furthermore, the term convalescence is translated as the following table might indicate:

Table 6.22: Evaluation of the Students' Translation of the Term "Convalescence"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translatio ns
1		حهامُ نا	23	
2	Convalescence	ءافشنا	18	تهامُنا
3		ہناعئنا	3	
4		No equivalent given	6	

In table (6.22) the majority of the students succeeded in finding the Arabic equivalent of the English term **convalescence** as illustrated in item (1) تهامُنا. In addition (18) students presented an acceptable translation of the term as shown in items (2) ءافشنا and (3)ہفاعئنا . Only (6) students failed to find the adequate Arabic equivalent and adopted the avoidance strategy.

Another example is in the term **pulse**:

Table 6.23: Evaluation of the Students' Translation of the Term "Pulse"

Item No	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		طَـٰٓ	27	
2	pulse	انبضمة خالد	20	طَبٌّ
3		No equivalent given	3	

Table (6.23) reveals that first year master students succeeded in finding the Arabic equivalent of the term **pulse** as illustrated in item (1) نبض and item (2) دائت. Only three students gave no answer to the English term.

Mistranslation

Table 6.24: Evaluation of the Students' Translation of the Term "Diaphragm"

Item N	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
		دَفرلى	28	
1	Diaphragm	No equivalent given	22	الحجاب الحاجس

The above table shows that nearly all of the students failed to find the Arabic equivalent of the term **Diaphragm**. Indeed, (28) of them transliterated it into دَفانرلىwhile the rest of the students (22) gave no equivalent to the English term.

Another example of mistranslation is exhibited in the translation of the term **the pit of the stomach** as follows:

Table 6.25: Evaluation of the Students' Translation of the Term "The Pit of the Stomach"

Item N	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		كُعْك عظمًنا	22	
2	**The pit of the stomach**	فجح عظمًنا عظمًنا	11	فجح عظمًنا
3		مخاد عظمًنا	2	
4		يستني عظمًنا	7	
5		يُطمح	3	
6		No equivalent given	5	

It can be noticed from the above table that the students supplied different translations of the term **the pit of the stomach.** The majority of them (22) translated it as كُعْك عظمًنا whereas (11) students translated it as فجح عظمًنا. Only (2) students translated the term as مخاد عظمًنا. The rest of the students presented a general translation of the term **pit,** as illustrated in items (4) يستني and (5) يُطمح. Finally, two students omitted the term from their translation.

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Table 6.26: Evaluation of the Students' Translation of the Term **"Substance"**

Item N°	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		جداي	43	
2	**Substance**	داي	5	ةدّاي
3		رصُ	2	
		ع	0	

The above table displays student's successful translation of the English term **Substance** as can be seen in item (1), where the majority of the students (43) translated it into the Arabic equivalent **ةدّاي**. Yet, (5) students translated it into the Arabic term **رصُع**. Also, the table exhibits students' confusion between singular and plural as illustrated in item (1) **قدام** and item (2) **داءي**.

Table 6.27: Evaluation of the Students' Translation of the Term **"Poisonous"**

Item N°	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		حيّاس	42	
2		حيّىًّسي	2	
3	**Poisonous**	حًّىًّسي	3	تياس
4		حًَروؤي	2	
5		واس	1	
6		No equivalent given	0	

Table (6.27) reveals that most of the students (42) presented a successful literal translation of the English term **Poisonous** into the Arabic language سامّ. The remaining students provided different translations of the term as can be seen in item 2, 3, 4, 5 سَامّة, مسمّمة, يؤذَّرتَ, ساو. Further, the table displays a difference in genre as exhibited in item (1) and (5) سامّت, ساو.

Table 6.28: Evaluation of the Students' Translation of the Term **"Serious illnesses"**

Item N°	The English expression	The Translated Forms	No. Of Occurrences	Suggested Translations
1		نكائكح الأمراض	2	
2		خُطر مرض	5	
3		خُطنرج الأمراض	33	
4	**Serious illnesses**	الأمراض	1	الأمراض الخُطرة
5		حاد مرض	1	
6		العاج اصعنح الأمراض	1	
7		جذةح الأمراض	7	
8		No equivalent given	0	

The above table reveals that numerous translations were supplied by the students to the term **serious illnesses.** It indicates that the majority of them (33) provided a successful Arabic translation of the English term **serious illnesses** as illustrated in item (3) الأمراض الخُطرة. The remaining students provided different unsuccessful literal translations as can be seen in items 1, 4, 5, 6. نكائكت الأمراض , حاد مرض, جذةت الأمراض . Further, one student under

translated the term as in item (4) and one student over translated it as in item (6) جلاعنا انبعت أراليض. Another problem related to the students' translation is related to the

notion of singular-plural as in in items (2), (5),ضري and items 1, 3, 4, 6, 7,الأنراض .

Overall Analysis

The analysis of the students' translation in the post test revealed that most of the students produced a successful translation of the medical terms. It revealed, also, that the number of under translated words decreased. Further, the students' use of the different reading comprehension strategies helped them to analyse the text and understand its terminology. On the other hand, the analysis exhibited the dominance of the literal strategy in translation.

6.5. Comparative Analysis

To explore the impact of reading comprehension strategies in the production an efficient translation of medical texts, a comparative analysis between the pre-post-test is used. It consists at analysing the data obtained from the translated pre-test and post-test. It, then, evaluates it to look for any significant reduction related to the students' problems in translation, so we can confirm or disconfirm, by then, our hypothesis.

Throughout the Analysis of the students' pre-post-tests, we noticed a variety of differences related to the students' translation of the medical texts, in general, and the medical terms, in particular. This difference mirrors the frequency and variation of the students' mistranslations, of the medical terms. It also displays students' omission to some medical terms whenever they fail to find their Arabic equivalents as follows:

Table 6.29: Statistics for, Mistranslation and Absence of Translation at Both Tests.

Type of Translation	Pre-Test	%	Post-Test	%
Unacceptable Translation	285	35.62	149	24.83
Absence of Translation	54	7.83	47	6.75

In view of the findings presented above, we notice that there is an improvement in the students' translation of medical texts. For the pre-test, we observed that first year master students produced 285 unacceptable translations of the medical terms with a percentage of (35.62%) whereas in the post-test 149 students' unacceptable translations were estimated with a percentage of (24.83%). As a result, in the post-test, students committed fewer mistranslations of the medical terms than in the pre-test. Further, regarding the number of omitted words, we estimated a sum of 54 omitted words in the pre-test with a percentage of (7.83%). However, in the post-test a sum of 47 omitted words was estimated with a percentage of (6.75%). Hence, students omitted fewer words in the post-test in comparison to the pre-test.

6.5.1. Students' Translation Strategies

Throughout the analysis of the students' translation of the medical pre-test and post-test, we observed a variation in the strategies used by the students in the translation of the medical texts as follows:

Figure 6.1: Rate of the Students' Use of the Translation Strategies in the Pre-Test and the Post-Test.
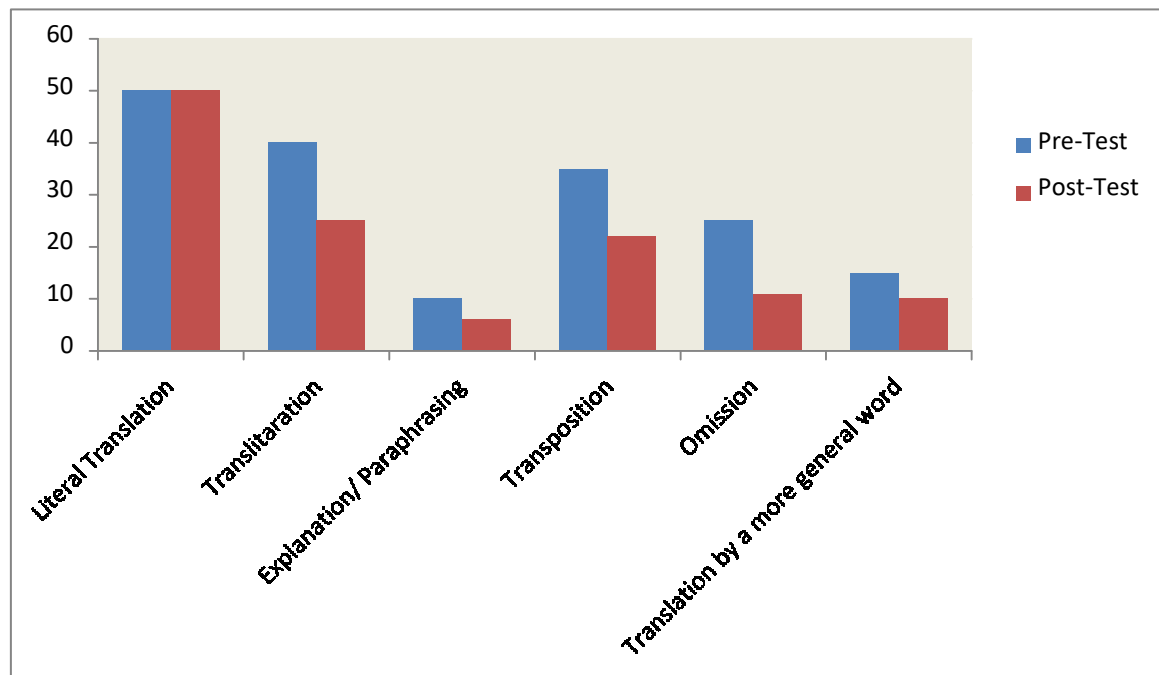
The above figure displays the different translation strategies used by first year master students of English in the translation of medical texts in both the pre-test and the post test. It indicates that the most frequent strategy used by the students is the literal translation in both tests, 50. Further, it revealed that a large number of the students opted for the transliteration procedure in the translation of some medical terms, 40 students in the pre-test, and 28 students in the post-test. However, a significant decrease was observed in the number of omitted words in the students' translations, 25 students in the pre-test and 11 students in the post-test. Last but not the least, a decrease in the students' use of explanation, transposition and translation by a more general word was observed. From 10 to 6, 35 to 22, 15 to 10 students, respectively.

Conclusion

In a nutshell, this chapter described, the research design and experiment implementation. It represented the selected population for the study and introduced the strategies Employed by first year master students of English at the University of Frères Mentouri, Constantine, in the translation of medical texts. It highlighted the instrument used for the data collection and procedure selected for its analysis. It, then, presented the results of the students' pre-post-tests and exhibited the terminological difficulties encountered while translating the English medical terms into their Arabic equivalents.

The analysis demonstrates that the specialised terminology that characterise the medical texts represent the overwhelming major problem encountered by the students in translation. Further, it indicates that the most common problem related to the students' translation of the medical texts is related to the inappropriate use of the available translation strategies. It also, displays the students' lake of knowledge of subject matter.

CHAPTER SEVEN

Pedagogical Recommendations

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Pedagogical Recommendations

Introduction

Translators of medical texts need to have a good command of both the source language (SL) and the target language (TL), a good knowledge of the subject matter, an up-to-date knowledge of their specialised field and a broad understanding of medical terms. As the translator of medical texts deals with a subject related to human beings and health, he should be careful in selecting the exact and accurate Arabic equivalent for each English medical term. This study has shed some light on a vital and specific field of translation which is medical translation with special emphasis on the translation of medical terms. Accordingly, it is hypothesized that if students manage to use reading comprehension strategies to generate interferences that can help them understand medical texts; their translation will be more efficient. The study investigated the problems of translating medical terms such as the names of diseases, conditions and symptoms, from English into Arabic. The study focused on the nature of potential challenges that the translation of medical terms presents for translators. It explored, theoretically, the notion of medical terms and how they work in both English and Arabic and also reviewed equivalence in medical terminology. As medical translation is related to technical translation, an overview of scientific and technical translation, in general, was first undertaken. It has been argued that the transfer of knowledge of modern science and technology is needed to cope with the constant growth and development of technology in the world. Thus, the technical translator plays an important role in this process of transferring and communicating through translating new technology, scientific discoveries and updated medical information from and into different languages around the world, so that all nations can access to the new technology. It has also been useful to include an overview of the efforts

made by some institutions and Arabic academies in the Arab countries on the issue of Arabization, translation and standardization in this study. The practical part of the study emphasized the difficulties and problems faced by first year master students of English at the Department of Letters and English Language, university if Frères Mentouri, Constantine in the translation of medical texts, in general, and medical terms, in particular .To find out the reality of these problems and how they affect their work as translators in the medical field, the study empirically investigated the translation of a medical text. After discussion of the analysis, it was possible to classify the type of strategies that the participants employed to translate such terms. Seven strategies were identified and exemplified, they are:

1 .Literal translation

2. Transliteration

4. Explanation/ Paraphrasing

5. Omission

6. Translation by a more general word (superordinate)

7. Transposition.

Comprehension strategy instruction helps students become purposeful, active readers who are in control of their own reading comprehension. These seven strategies have research-based evidence for improving text comprehension.

Students who are good at monitoring their comprehension know when they understand what they read and when they do not. They have strategies to "fix" problems in their

understanding as the problems arise. Research shows that instruction, even in the early grades, can help students become better at monitoring their comprehension.

Comprehension monitoring instruction teaches students to:

- Be aware of what they do understand

- Identify what they do not understand

- Use appropriate strategies to resolve problems in comprehension

McNamara, (1995:307) identifes the following reading strategies:

7.1. Metacognition

Metacognition can be defined as "thinking about thinking.". It is known as the Awareness and understanding of one's own thought processes. Good readers use metacognitive strategies to think about and have control over their reading. Before reading, they might clarify their purpose for reading and preview the text. During reading, they might monitor their understanding, adjusting their reading speed to fit the difficulty of the text and "fixing" any comprehension problems they have. After reading, they check their understanding of what they read. (ibid:307)

According to McNamara, (ibid: 308), students may use several comprehension monitoring strategies:

7.1.1. Identify where the Difficulty Occurs

This monitoring strategy consists at identifying the problem and looking for possible solution to deal with it. Eg: "I don't understand the first paragraph on page 30". Selecting the adequate

reading comprehension strategy can be a good procedure in dealing with problem related to the comprehension of texts.

7.1.2. Identify what the Difficulty is

Reading difficulties may appear in many different forms and range from an inadequate vocabulary building to medical conditions, such as dyslexia. Learning how to assess a reader's ability and to identify reading difficulties requires attention to detail, to gauge a readers comprehension levels and skills. Therefore, knowing where the difficulty is will permit the students to use the adequate tools to overcome the problem of reading comprehension.

7.1.3. Restate the Difficult Sentence or Passage in their Own Words

Restating and paraphrasing refers to the act of following the authors' line of reasoning and its sequence of ideas, in the student's own words. The paraphrase should give the reader an accurate understanding of the author's position on the topic. The purpose of a paraphrase is to convey the meaning of the original message and, in doing so, to prove that you understand the passage well enough to restate it. The student's main objective is to uncover and explain all the facts and arguments involved in your subject.

7.1.4. Look Back through the Text

Students cannot always remember everything that they read. If we read an article or book chapter, though, and are asked a 'fact' question about it that we cannot answer, we can always look back in the article to find the information that we need. Eg:"The author talked about Mr. McBride in Chapter 2, but I don't remember much about him. Maybe if I reread that chapter, I can figure out why he's acting this way now."

7.1.5. Look forward in the Text for Information that Might Help them to Resolve the Difficulty

Looking forward in a text may help students enhance their comprehension of the texts Eg:"The text says, 'The groundwater may form a stream or pond or create a wetland. People can also bring groundwater to the surface.' Hmm, I don't understand how people can do that… Oh, the next section is called 'Wells.' I'll read this section to see if it tells how they do it."

7.2. Answering Questions

Asking questions can be effective in the comprehension of medical texts because they:

- Give students a purpose for reading

- Focus students' attention on what they are to learn

- Help students to think actively as they read

- Encourage students to monitor their comprehension

- Help students to review content and relate what they have learned to what they already know

The Question-Answer Relationship strategy encourages and helps students to learn how to answer questions better. Students are asked to indicate whether the information they used to answer questions about the text was textually explicit information (information that was directly stated in the text), textually implicit information (information that was implied in the text), or information entirely from the student's own background knowledge.

There are four different types of questions:

7.2.1. "Right There"

Questions found right in the text that ask students to find the one right answer located in one place as a word or a sentence in the passage.

Example: Who is Frog's friend? Answer: Toad

7.2.2. "Think and Search"

Questions based on the recall of facts that can be found directly in the text. Answers are typically found in more than one place, thus requiring students to "think" and "search" through the passage to find the answer.

Example: Why was Frog sad? Answer: His friend was leaving.

7.2.3. "Author and You"

Questions require students to use what they already know, with what they have learned from reading the text. Student's must understand the text and relate it to their prior knowledge before answering the question.

Example: How do think Frog felt when he found Toad? Answer: I think that Frog felt happy because he had not seen Toad in a long time. I feel happy when I get to see my friend who lives far away.

7.2.4. "On Your Own"

Questions are answered based on a student prior knowledge and experiences. Reading the text may not be helpful to them when answering this type of question.

Example: How would you feel if your best friend moved away? Answer: I would feel very sad if my best friend moved away because I would miss her.

7.3. Generating Questions

By generating questions, students become aware of whether they can answer the questions and if they understand what they are reading. Students learn to ask themselves questions that require them to combine information from different segments of texts. For example, students can be taught to ask main idea questions that relate to important information in a text.

7.4. Recognizing Story Structure

In story structure instruction, students learn to identify the categories of content (characters, setting, events, problem, resolution). Often, students learn to recognize story structure through the use of story maps. Instruction in story structure improves students' comprehension.

7.5. Summarizing

Summarizing teaches students how to discern the most important ideas in a text, how to ignore irrelevant information, and how to integrate the central ideas in a meaningful way. Teaching students to summarize improves their memory for what is read. Summarizing requires students to determine what is important in what they are reading and to put it into their own words. Instruction in summarizing helps students:

- Identify or generate main ideas.
- Connect the main or central ideas.
- Eliminate unnecessary information.

- Remember what they read.

7.6. Effective Comprehension Strategy Instruction is Explicit

Research shows that explicit teaching techniques are particularly effective for comprehension strategy instruction. In explicit instruction, teachers tell readers why and when they should use strategies, what strategies to use, and how to apply them. The steps of explicit instruction typically include direct explanation, teacher modeling ("thinking aloud"), guided practice, and application.

7.7. Direct Explanation

Direct explanation refers to the act of explaining the steps in a thought process that give birth to comprehension. The teacher explains to students why the strategy helps comprehension and when to apply the strategy.

7.8. Modeling

The teacher model a strategy by thinking aloud about how he is going about understanding a passage. They include information on why and when to use the strategy. Then instructions are given to students. The teacher models, or demonstrates, how to apply the strategy, usually by "thinking aloud" while reading the text that the students are using.

7.9. Guided Practice

Guided practice is the process of helping students achieve understanding by guiding them step by step while applying the suggested strategy. In other words, the teacher guides and assists students as they learn how and when to apply the strategy to assure a better understanding   of   a   text.

7.10. Application

Application refers to the role of the teacher to help students practice the strategy until they can apply it independently.

Effective comprehension strategy instruction can be accomplished through cooperative learning, which involves students working together as partners or in small groups on clearly defined tasks. Cooperative learning instruction has been used successfully to teach comprehension strategies. Students work together to understand texts, helping each other learns and apply comprehension strategies. Teachers help students learn to work in groups. They also provide modeling of the comprehension strategies.

While the ability to read and furthermore, to understand what is written, is critical to success in our educational system, our nation's report card in reading achievement is lackluster at best. Moreover, comprehension problems become most apparent when students are faced with textbook material (e.g., Best, Floyd, & McNamara, 2008; McNamara, 2001).

7.11. Why Can't Students Understand What They Read?

Reading problems stem from several sources. First, second language learners may not be able to read the words themselves due to their complexity especially in specific registers such as medicine, which is full of specified terminology. Indeed, "word decoding development" is the concern of many researchers and educators, particularly for younger children and children with learning inconsistencies. However, this concern has sometimes led to the neglect of the counterpart of word decoding: sentence comprehension. Various problems can occur for the reader at the comprehension level. Understanding how the words come together in each sentence can be a challenge. Or, the student may understand each word and even each sentence, but fail to understand the relationships between the sentences and the

meaning of the text as a whole and, hence, fail to translate it into the target language. Further, the stumbling block may not be sufficient reading ability to understand more familiar genres of text, but rather, the student may only hesitate when faced with challenging texts which consist of complex structures and specialized terminology which can be understood only by professionals. The reader may lack the requisite knowledge. More importantly, the student may lack the reading strategies necessary to overcome such challenges.

7.12. Understanding how the Words Come to Gathering Each Sentence Can be a Challenge.

Many readers lack sufficient reading abilities and knowledge to understand the type of texts. According to McNamara, Kintsch, Songer, & Kintsch, (1996); McNamara, (2001:51) Word knowledge is particularly helpful to understanding text genres such as narratives or novels, but students need domain-specific knowledge to understand their textbook material. Domain knowledge refers to knowledge about the topic of the text such as knowledge about science, history... Specialized Textbook materials especially medical ones tend to be challenging for most students because students often lack sufficient domain knowledge and, hence, face hard hurl difficulties to comprehend texts full of specialized terminology. Indeed, textbooks contain unfamiliar words, unfamiliar concepts, and have structures particularly connected to instructional textbooks. In addition, McNamara, Kintsch, Songer, & Kintsch, (1996) noted that textbooks tend to have numerous cohesion gaps, causing additional difficulties for many students. Cohesion gaps occur when there is little conceptual overlap or explicit connections between sentences. Cohesion gaps oblige readers to access knowledge in order to make connections between sentences. More important, making these connections requires both general and domain knowledge. (ibid.)

7.13. How Can We Help Poor Readers?

Readers may encounter many obstacles in the path to comprehend texts especially medical texts, which are full of specialized vocabulary. Regardless of the importance of the reading problems, teaching strategies is one of the most effective means of helping students to overcome reading problems McNamara (2005:87), Strategy instruction across a variety of domains builds on the notion that less skilled students should learn strategies that imitate those exhibited by skilled students or that compensate for processes exhibited by skilled students. The underlying assumption is that the processes or skills induced by the strategies become more automatic with practice. Strategies provide the means to tackle complex problems in more efficient ways and, with practice, the strategies lead to skills that become automatic and quick over time. The importance of reading strategies is becoming increasingly recognized. This recognition is perhaps best exemplified by the inclusion of a Reading Strategies strand in English Language Arts College Board Standards for College Success published in 2006 by the College Board College Board Standards (McNamara, Ozuru, Best, & O'Reilly,2007). The fact that this strand was adopted by the College Board underlines growing recognition that high ability students use reading strategies and these strategies are essential, not only to successful comprehension, but to overcoming reading problems and becoming a better reader .

7.14. The Importance of Reading Strategies to Overcome Reading Problems

To overcome reading problems, it is crucial for learners to use reading strategies. For example, Prediction strategy involves thinking about what might be coming next in the text. For the most part, predictions are relatively uncommon (Magliano, Baggett, Johnson, & Graesser, 1993; McNamara, 2004).Yet, it may be more useful when reading narrative texts than when reading science texts. Predictions are also more common and useful when the

predicted outcomes are highly constrained or highly probable (Magliano, Dijkstra, & Zwaan, 1996; van den Broek, 1994). Though predictions are not likely to contribute a great deal to comprehension of science text, they are included in SERT because exposure to them indicates to the student to think ahead and more globally while reading. Predictions are also included because they may eventually enhance readers' ability to understand texts. Finally, making "bridging inferences" is the process of linking ideas and understanding the relations between separate sentences in the text. Deep comprehension requires more than simply interpreting individual sentences; the reader must also be able to integrate individual sentence meanings into a coherent text level representation (Kintsch, 1988; 1998). Making inferences is critical to text comprehension because texts normally do not (or cannot) state all of the relevant information (e.g., McNamara et al., 1996). Therefore, to successfully comprehend a text, the reader must generate inferences to fill in "missing" information and build a coherent mental model that incorporates information in the text (Zwaan & Singer, 2003). The meaning of a text can remain fragmented and disconnected without inferences. In sum, inferences that link sentences in a text combine the individual sentence meanings distributed across the text into a more coherent structure (Gernsbacher, 1997; Kintsch, 1988). McNamara (2004) showed that SERT instruction helped readers to generate more effective self-explanations.. Those students who were prompted to self-explain (as in Chi et al., 1994) were compared to those who were provided with training to self-explain using the reading strategies (i.e., SERT). Those who received the additional training on reading strategies (i.e., SERT) show significantly better comprehension than those who were simply encouraged to self-explain. The effects of training on comprehension were also most evident for low-knowledge participants. Analyses of the self-explanations produced by the participants after training indicated that SERT's primary role was in helping the low-knowledge readers to use logic, common sense, or general knowledge to self-explain the text. Thus, the results showed that SERT helped the

low-knowledge students to more effectively self-explain the text (using more effective strategies) and, as a consequence, they showed considerably better comprehension than the low-knowledge participants in the control condition who had not received training. Moreover, low-knowledge participants who received SERT showed comprehension performance comparable to the high-knowledge participants. Notably, these benefits only emerged on the text based questions. The low-knowledge readers did not have sufficient domain knowledge to generate inferences to support a coherent deep understanding of the text, or situation model. Nonetheless, the use of paraphrasing along with the generation of inferences based on logic and general knowledge helped the readers to understand the basic ideas in the text and form a more coherent text base level understanding.

7.15. Why Is Self-Explanation Reading Strategy (SERT) Effective?

McNamara, (1995) states: "self-explanation reading strategy (SERT) is closely related to theories of comprehension and theories of knowledge and skill acquisition". Additionally, Hirsch (2006) argues that there are few reading strategy programs of instruction that are well aligned with theories of text comprehension. He further argues that Reading strategies cannot be trained in isolation of each other or in contexts separate from the target content. Self-explanation, in contrast, encourages the reader to use a combination of strategies, all of which are encouraged by the process of attempting to explain the text. Hence, the reader's objective is to understand the text to the level that it can be explained. The most important aspect of SERT training is that the students learn to self-explain text, and that they learn reading strategies that help this process. A teacher can implement SERT by explaining and demonstrating self-explanation and elaboration, and encouraging students to self-explanation. The one important aspect of explanation is a natural activity that "externalizes" the understanding of the text and at the same time has an overt purpose McNamara (op,cit.)

Yet, self-explanation is not enough. Readers must also understand how to effectively self-explain a text. SERT does not just give examples to help the students comprehend a text. The student also learns to identify the various strategies, and most importantly, practises the strategies. No skill can be learned without practise; and thus, the student practises the strategies during SERT and is encouraged to practise the strategies after SERT. For instance, paraphrasing is important in the comprehension of texts because it helps the students to start the explanation with the use of his own and personal words and expressions According to Kintsch, (1988:163) deep comprehension of a text requires more than simply interpreting individual sentences; "the reader must also be able to integrate individual sentence meanings into a coherent text level representation" (ibid.163) .Other reading strategies include comprehension monitoring, elaboration, logic or common sense, predictions, and bridging. These strategies represent reading processes that are characteristic of effective self-explanation. McNamara, (2004).

GENERAL CONCLUSION

The notion of reading comprehension has always been an important topic of discussion in the history of translation. As Hatim and Mason (1990:224) point out, the translators are in fact mediators and in a way they are "privileged readers" of the source language text and unlike ordinary readers, they "read in order to produce, decode in order to re-encode". In this respect, the present study has shed some light on specific field of translation which is medical translation with special emphasis on the translation of medical terms. The study investigated the difficulties encountered by first year master students of English at the department of Letters and English Language at the University of Frères Mentouri, Constantine, in the translation of medical texts. It tried to depict the student's translation of medical texts from English into Arabic, and to elicit the terminological problems they encounter while rendering the English source text into its Arabic equivalent. It attempted also to identify the importance of reading comprehension strategies in the production of an effective translation of medical texts. Accordingly, we assumed that if first year master students of English manage to use reading comprehension strategies to generate interferences that can help them understand medical texts; their translation will be more efficient.

Consisting seven chapters, the first four chapters presented the theoretical foundation, whereas, the last three chapters comprised respectively: two chapters related to the practical work and a chapter that overviewed some pedagogical implications and suggestions for further research. To begin with, the first chapter overviewed of the scope of scientific and technical works with an emphasis on the dominance of English on most of the scientific works. Chapter two featured theoretical aspects related to the scope of scientific translation. Chapter three, Provided relevant matters related the medical language and the medical

translation. It started with an analysis of English medical terms, the derivations of English medical terms and the derivations of Arabic medical terms. It also described problems of equivalence in the translation of medical texts including neologisms, non-equivalents and terminological inconsistencies. Chapter four focused on the importance of reading comprehension in generating interferences that can help in understanding scientific and medical texts. Regarding the practical part, chapter five and six provided respectively the analysis of the students and teachers questionnaires, the experiment implementation, and the analysis and interpretation of the pre-test and the post test.

The analysis of the source data revealed that Medical translation is one prominent area which requires broad knowledge in the field and a good mastery of the source and target languages. It involves also the use of reading comprehension strategies that help in the acquisition of vocabulary and the development of a good understanding of the medical text. Hence, the research analysis confirms that using reading comprehension strategies will enhance students' translation of medical texts.

As a result, students as future practitioners in the field of translation should build solid foundation of language skills, under the supervision of teachers who introduce reading comprehension in their classes to support their students in the translation of medical texts which is a quite complicated area of study.

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المراجع و الكتب العربية

سان جلن علين التشربح السرير الاصدر و الاظهر عربي انجلسي ـ ترجوت حوديد طلبزي ابناري فوادي و زياد بيطخلا. دهشق
2008 القذش دار، العلم

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Appendices

APPENDICES

APPENDIX ONE

Students' Questionnaire

Dear Students

Thanks for accepting to undertake the present questionnaire, which is carried out for the purpose of research. The Questionnaire will not be marked and is anonymous. Nevertheless, you have to work individually in order to have reliable results. Your contribution is very important for the present research that is why we are expecting you to be sincere and objective in answering the questionnaire. Thanks in advance.

Section One: Students' Knowledge

Question One:

Specify your gender, please

      a) Male

      b) Female

Question Two:

What types of texts do you usually read?

      a) Literary texts

      b) Scientific texts

      c) General texts

      d) Others

Question Three:

Is the scientific text is characterized by the use of:

      a) Logical expository and argumentative progression

b) Lack of argumentative progression ☐

c) Expensive use of figurative expressions ☐

d) Denotative meaning ☐

e) Others ☐

Question Four:

What is medicine?

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Question Five:

What is the difference between science and Medicine?

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Question Six:

According to you, what is the main aim of a translator of scientific texts?

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Question Seven:

Are « Faux Amis » :

a) Words that are spelled differently but have the same meaning ☐

b) Words that are spelled in the same way but have different meanings ☐

c) Compound words ☐

d) Others ☐

Section two: Students' Intricacies in the Translation of Medical Texts

Question Eight:

Do you practise translation outside you syllabus programmes?

a) Yes

b) No

c) I don"t know

Question Nine:

If your answer is „yes", is it:

a) Often

b) Sometimes

c) Occasionally

Question Ten:

What is the first thing you do when you are asked to translate a medical text?

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…………………………………………………………………………........................
....

Question Eleven:

What kind of strategy do you use in your translation of medical Texts?

a) Literal translation

b) Loan translation

c) Free translation

d) Transliteration

e) others

Question Twelve:

What do you consider as the most difficult aspect in the translation of a medical text?

a) The choice of appropriate expressions ☐

b) Clear understanding of the source text message ☐

c) The ability to deliver the source text message into a meaningful target ☐

d) Terminology ☐

Question Thirteen:

To what extent do you think the translation of medical texts from English into Arabic

possible?

....

....

....

Question Fourteen:

How frequently do you encounter "faux amis" in your translations of medical texts?

a) Often

b) Sometimes ☐

c) Occasionally ☐

Question Fifteen:

How useful would a corpus or glossary of medical terminology be to your translation?

....

....

....

Question Sixteen:

Do *faux amis* cause you problems in your translation of medical texts?

a) Yes

b) No ☐

c) I don"t know ☐

Question Seventeen:

If your answer is yes, how do you deal with them?

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....
....

Question Eighteen:

How effective and understandable is the translation of the source medical text for the target

audience?

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

Question Ninteen:

Are you satisfied with the course material provided to the translation of medical texts?

    a) Yes

    b) No

    c) I don"t know

Question Twenty:

If your answer is No, Please explain why?

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....
....

Question Twenty One:

Are you satisfied with the teaching methods adopted in the course?

    a) Yes

    b) No

c) I don''t know

Question Twenty Two:

If your answer is No, please explain why?

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

Section Three: Students' Opinion Regarding Reading Comprehension

Question Twenty Three:

Do you apply some of reading strategies such as prediction, skimming, scanning…etc. to understand what you read?

a) Yes

b) No

Question Twenty four:

Do you read texts quickly to get an overview of its content when you ae asked to translate? If yes, please, say whay.

a) Yes

b) No

Question Twenty Five:

When you read do you relate the text to your background knowledge?

a) Yes

b) No

Question Twenty Six:

Do you guess the meaning of words from their context in the text?

a) Yes

b) No

Question Twenty Seven:

Do you think that learning reading strategies may help you to achieve reading comprehension during your study?

a) Yes

b) No

APPENDIX TWO

Teachers' Questionnaire

We are conducting a study to find out the difficulties encountered by students in the translation of medical texts. We would be pleased if you could help us to achieve the aim of research. Without your help and contribution the research would be impossible to achieve.

Thank you for your precious contribution

Mrs Nassima NENCHABANE

Department of Letters and Languages

University of Constantine1

Please answer the following questions by ticking the suitable answers.

Question One:

Degree held

a) BA

b) Master

c) Magister

d) PhD

Question Two:

What type of texts do you often give to your students to translate?

a) Literary texts

b) Scientific texts

c) General texts

d) Others

Question Three:

Are the selected texts based on the students" interests or based on the students" needs? Why?

       a) Students" interests   ☐

       b) Students" needs   ☐

Question Four:

Are the translation basics enough for successful translation?

       a) Yes   ☐

       b) No   ☐

If no, justify your answer please

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………

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Question Five

Do you introduce your students to the translation of medical texts?

       a) Yes   ☐

       a) No   ☐

If yes, how often please?

       a) Frequently   ☐

       b) Sometimes   ☐

       c) Occasionally   ☐

Question Six

Does learners" experience in translation plays a major role in his/ her success or failure in the translation of medical texts.

a) Yes ☐

b) No ☐

Please, justify your answer

……
……
………………………………………………………………………………………………

Question Seven

What kind of strategy do you use in the translation of medical Texts?

a) Literal translation ☐

b) Loan translation ☐

c) Free translation ☐

d) Transliteration ☐

e) others ☐

Please, justify your answer

……
……
………………………………………………………………………………………………….

Question Eight

Which feature do you think students should focus on while translating medical texts?

a) Context ☐

b) Rhetoric ☐

c) Vocabulary ☐

d) Meaning ☐

e) Equivalence ☐

f) Grammar ☐

g) Others ☐

Question Nine

Translation is "the translation of meaning from SL to TL"; to what extent can this definition be applied to the translation of medical texts.

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Question Ten

Which procedure do you use while introducing students to the translation of medical texts? Explain.

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Question Eleven

Do you think the student failure in translating medical texts is related to:

a) The specialised vocabulary ☐

b) Finding equivalence between the SL and the TL ☐

c) The mastery of the translation basics ☐

d) The approach used in translation ☐

Question Twelve

To what extent do you think the translation of medical texts from English into Arabic possible?

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Question Thirteen

How useful would a corpus or glossary of medical terminology be to your translation?

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Question Fourteen

Is it advisable to focus on "translating meaning" rather than "translating equivalence"?

       a) Yes   ☐

       b) No   ☐

Justify your answer, please

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Question Fifteen

During learning, learners face difficulties which may hamper their progress. As a teacher what advice would you like to provide in order to help them improve their translation of medical texts?

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Section Three: Teachers' views on Reading Comprehension

Question Sixteen:

Do you introduce your students to the notion of reading comprehension in translation classes?

      a) Yes   ☐

      b) No   ☐

Question Seventeen:

If your answer is yes, on which reading comprehension strategy do you focus more when you introduce students to the translation of medical texts?

- a) Skimming and scanning
- b) Inferring
- c) Guessing the meaning of new words
- d) Self-monitoring
- e) Summarising
- f) Combining all of them

Question Eighten:

Do you think that teaching reading comprehension strategies may help students improve their translation of medical texts?

- c) Yes
- d) No

Question Ninteen:

Do you think that teaching reading strategies may help students to achieve reading comprehension during their study?

- e) Yes
- f) No

APPENDIX THREE

Pre-Test.

Please translate the following text into Arabic

The human body is made up of a number of different systems. Each system has a specific function, but some work together. One system is the Skelton, which serves to support the body and protect the internal organs. The respiratory system enables us to breathe and take oxygen into the blood, which moves around the body by means of the circulatory system. The digestive system enables us to take in food needed for growth. Waste matter is dejected from the body by means of the urinary system.

The Endocrine system consists of various glands, such as the thyroid, sex and adrenal glands. The function of these glands is to secrete chemical, known as hormones, into the blood. These hormones control various processes in the body, such as growth, sexual activities and digestion. The nervous system controls the other systems and enables human beings to think.

Each system is made up of organs. The Lungs, for example, are part of the respiratory system. The heart is the organ in the circulatory system. The liver functions as part of the digestive system and other systems.

APPENDIX FOUR

Post-test

Please translate the following text into Arabic

Causes: The disease may be brought on by taking any substance which is in itself poisonous into the stomach, by a large amount of food taken at one time when the constitution is feeble, or when there is convalescence of some serious illness. The disease is sometimes brought on by imperfect mastication of food. The doctor should be called in on the appearance of the symptoms and his directions implicitly followed.

Symptoms: Gastritis is inflammation of the mucous membrane of the stomach, causing pain of a burning character at the pit of the stomach, vomiting on eating and drinking, and sometimes hiccough. The pulse becomes small and feeble; the patient is pale and faint, with cold extremities; the movements of the diaphragm cause pain and consequently the breathing is short; there is tormenting thirst at times, although the water drunk is vomited at once.

APPENDIX FIVE

Suggested Translation of the Pre-Test

ﮔﻤﻜﺰﺔ ﺳﺞ ﺏﺴﻟﺍﺍ ﯽﻓ ﺫﻉ ﯽﻓ ﻍﻈﻟﻷﺍ ﯽﻓ ﻍﺍﺪﻧﺯﺨﻣﺄﻧﺍ. ﻣﮑﻦ ﻮﺒﻈﻣ ﻍﻨﺜﻈﻣ ﺔ ،ﺤﺬﺤﯽ ﯽﮑﻦﺔ **ﻂﻌﺚ** ﻍﻈﻟﻷﺍ ﻍﺪﯾﺑﻜﺰﯼ. ﮥﺔ ﯽﻓ ﻮﺯﺔ ﻍﺔﻈﻟﻷﺍ ﻣﺒﺔﺞ ﻣﻜﺔﻧﺍ ﺔﺔﻈﻌﻧﺍ ﺔﺯﻧﺍﺔ ﺔﺔﻈﻌﻧﺍ ﻣﺔﺔﻍ ﺔﻩﻉ ﺳﺞﻧﺍ ﺏﻊﺩ ﺳﺞﻧﺍ ﻍﺄﻳﺔﺤﺔ ﻊﺑﻌﻌﻟﻷﺍ ﻍﮥﺨﺍﻧﻧﺍ. ﺏﮥﮥﻜﺔ ﻣﺒﺔﺞﺔ ﺔﺴﻔﮥﺯﻧﺍ ﯽﻓ ﺳﻔﮥﺯﻧﺍ ﺯﺨﺃﺔ ﯽﮥﺠﺴﻜﻟﺍﺃ ﻥ ،ﻮﺫﻧﺍ ﻥ ﺔ ﺔﺯﻧﺍ ﻣﻤﮥﺯ ﻥ ﻣﮏ ﻊﺑﺤﺔﺍ ﺳﺞﻧﺍ ﯽﻋ ﻛﺔﺵﻍ ﻣﺒﺔﺞ ﺤﺲﺔﺫﻧﺍ ﻍﮥﻭﯾﻧﻧﺍ. ﺏﮥﮥﻜﺔ ﻣﺒﺔﺞﻧﺍ ﺔﺔﻉﺔﻧﺍ ﯽﻓ ﺭﺒﺨﺮﺍ ﻥﻙ ﺑﯽ ﺔﺠﺒﺯﺤﺔ ﯽﻓ ﻉﺍﺯﺍﺀ ﻍﯿﻮﻑ ﺑﯿﺃ ﺔﻥ ﺔﮥﺃ ﺔﻥ **ﺩﻻﻋﻔﻧﺍ** ﺯ ﯽﻋ ﺑﺔﺤﺔ ﻛﺔﺵﻍ ﻣﺒﺔﺞﻧﺍ ﺔﻧﺞﻧﺍ.

ﺔﮥﺯﺤﺔ ﻣﺒﺔﺞﻧﺍ ﺔﻍﺒﺨﺨﺔﻧﺍ ﺔﻩﻉ ﺫﻉ ﯽﻓ ﺫﻉﻧﺍ ،ﻊﺑﺼﻧﺍ ﺤﺫﻍﻧﺒﮏ ﻍﺤﺲﻟﺴﻧﺍ ﺔ ﺤﺫﻍﻧﺍ ﻍﮥﺴﺒﮥﺯﻧﺍ ﺩﺫﻍﻧﺍﺔ ﻍﮥﻂﻈﻜﻧﺍ. ﻍﻨﺜﻈﻣ ﺔ ﻮﺯﮥ ﺫﻉﻧﺍ ﺔﺔ ﻣﺍﺋﻬﻟﺍ ﺤﺪﺑﯽ ﺨﺔﮥﺑﺔﺤﺔﮥﺔ، ﻍﻨﺔﺵﻋﻧﺍﺔ ﺳﺒﺚ ﺩﺑﺔﻭﯾﺵﻧﺍ ﻥ ﻮﺫﻧﺍ. ﻍﺯﮥ ﺩﺑﺔﻭﯾﺵﻧﺍ ﻣﻜﺤﺰﻥ ﻥ ﺫﺒﺔﮥﺔﻉ ﻍﻨﺪﻧﺯﺨﯽ ﻥ ﻍﻨﺪﻧﺯﺨﯽ ﻥ ،ﺳﺞﻧﺍ ﻣﺜﯽ ﻍﺒﻄﻧﺄ ﺔﮥﻧﺍ ﺔﺴﮥﺞﻧﺍ ﻊﻍﻧﺍ. ﻣﻜﺤﺰ ﺔﺠﺼﻌﻧﺍ ﻣﺒﺔﺞﻧﺍ ﻥ ﻣﻀﺔﺠﻟﺃﺍ ﺢﺔﺩ ﺵﺨﻟﺃﺍ ﺔ ﮐﻛﺔﺔ ﺵﻄﺠﻧﺍ ﯽﻓ ﺵﮥﻓﺰﻧﺍ.

ﮔﻤﻜﺰﺔ ﺔ ﻮﺒﻈﻣ ﺔ ﻣﮏ ﯽﻓ ﺩﺑﺌﻣﮥ. ،ﺤﮥﺰﺋﻧﺍ ﺔﻩﻉ ﻣﻬﻣ ﺴﺒﺌﻧﺍ ﻟﺒﺌﻧﺍ ﺤﺄﻩﺔ ﻥ ﻣﺒﺔﺞﻧﺍ ﺔﺴﻔﮥﺯﻧﺍ. ﺘﻬﻣﻧﺍ ﺔ ﯽﻋ ﻉﻉ ﻣﺒﺔﺞ ﺤﺲﺔﺫﻧﺍ ﻍﮥﻭﯾﻧﻧﺍ. ﺫﻉ ﺫﺠﻛﻧﺍ ﻊﻀﺞ ﯽﻓ ﻣﺒﺔﺞﻧﺍ ﺧﺔﺔﻈﺔﺍ ﺃ ﺔﺔﻉﻉﻧﺍ- ﯽﻂﺨﺃ.

APPENDIX SIX

Suggested Translation of the Post Test

الانزعاج بقة

السجبق: إمكنة خبصلإا ازمة ضشًنا عم كلشغ ل نبر حدبي خيبس نة ا غاشللنلإبانة مكلاأ ذنع جحبنع نا وي **فعظ** ، خعبنًنا بيذنع نة **أ** نَمك نبنة شبعزًا وي **طعث** ضاشيلاأ حنطخنا. ضشنًنا نَمك احنبنب كبنه. دائ نًعي عس نجس ضشنًنا

خنازغنا. ونح نّرا تج دسبطزسا نجطنا ذنع سمنة **ظ** لأ ضاشعلاأ.

ضاشعلاأ: قبةزنا حذعنًا قبةزنا نة عبطقنا ةغبخنًا، حذعنًهن بنةي تجسر نرللا **دار** عبنغ قشح نة حنفحنا حذعنًا نةمنا نة مكلاأ، ةشطنا نة قافنا نة احنبنب أحبحنا. طجنة حجص ننغص **فعظ**. **طـ**نشًنا بجحبض، ذفبخنة عي حدنشب. دباكنشح قبجحنا تجسث نجبحنا، نجخنا نزبنبث سفنًرنا حنصل. نبنة ةزعر صطعنا نة طعث نبحلاأ نةوع نغنشلا وي نًأ عبنًا نة خنبح نكس أنمرّآ نة ذحانًة.

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APPENDIX SEVEN

Sample of students' translation Pre –Test

Students # 1

Students # 2

يتكون جسم الإنسان من عدة ... أعضاء ... لكل جهان وظيفة معينة
لكن المعرفة بجملتها معا ... الممكن للعضو ... يقوم بـ الأجهزة ... الذي تدعم
الجسم و تحمي الأعضاء الداخلية ... الجهاز التنفسي يساعدنا على التنفس
أو ... دخول الأكسجين الدم الذي ينتقل في الجسم عند خلال الجهاز ...
الدوران ... الجهاز الهضمي يساعدنا على تناول الأطعمة التي نحتاجها
للنمو ... يتم الهضم من العضلات دون استخدام الجهاز البولي ...
جهاز العد ... يتكون ... عدة ... أعضاء ... تعمل و تعاون و ...
أدرينالين ... و كثيرة من العضو من مرور إفراز ... ند دعم الهرمونات
تقوم بـ ... و ... استخدام في الدم ... ... و ... الجسم و الرحم
كالدموع و الغدد ... الحسية ... ... الجهاز العصبي و يتحكم في الأجهزة
الأخرى ... و يمكن الإنسان من التفكير
كل جهاز يتكون من أعضاء ... مختلفة ... يعتبر ... أحد من الجهاز
التنفسي ... القلب عضو من هذه الأجهزة و الموازين و الكبد تعد عبارة
... ... و بعض من الأجهزة الأخرى
كل ... و يتكون من ... أنسجة ... الأنسجة ... بالخلايا التي تكون
المشتركة ... و أشكال ... يكون و يشارك في الأنسجة المختلفة تدعم
و تحمي أجزاء الجسم و تحوي على ... و نهوضها ... أنواع أخرى
... الأنسجة ... ... الأنسجة العصبية و الدموية
... الأنسجة ... يحتوي جسم الإنسان على تقارب ... ... الخلايا ...
و يمكن و مؤنة ... الخلايا يكون و ... بينها ... علاقات ... بينها
و عدوة الذي ... حول المؤلفة و الأنسجة ... ... و تحتوي
بعضها البعض ... هذا يحتوي على أدوات الأجزاء ... لكل ...
و وظائف الأنسجة ...

Students # 3

Students # 4

[handwritten Arabic text - illegible]

Students # 5

يتكون جسم الانسان من أجهزة مختلفة ، كل جهاز لديه مهام
خاصة به ، و لكنه بعضها قد يعمل معا ، من بين هذه الأجهزة
الجهاز الهضمي ، و الذي يهضم الطعام ، و بعض الأجهزة
الداخلية ، و الجهاز التنفسي ، و الذي يساعد تأبط على التنفس
، و أخذ الأكسجين اك الدم الذي يدور حول الجسم .
ها يهتم بالدورة الدموية ، و الجهاز الهضمي ، و الذي
يساعد نا على أخذ الطعام الذي نحتاجه للنمو ، أما النفايات
تخرج من الجسم بواسطة جهاز طرح النفايات .
كل جهاز يتكون من أعضاء ، خاصة مثلا ، من جزء هنا
من الجهاز التنفسي ، و القلب عضو في جهاز الدورة الدموية
أما الرئة عضو جزء من جهاز الهضم
كل عضو يتكون من عدة أنواع من الأنسجة ، العضلات الملس
، و التي يتكون منه القلب ، و هناك نوع و جدي أعضاء الجسم
التي تكون من العظام
هناك أنواع أخرى من الأنسجة تغطي سطح النوع الضوح ، و السح
الدموي
كل نسيج يتكون من خلايا مختلفة تقابل به ؟ وظائف متعددة
، تتعاون فيما بينها و باستخدام الطب الكبير
كل خلية معناة يكفيه رحمة تحيط بالنواة ، و السيكلكيرها
و هذه هي جوهر ، أنوية تحمي كيان لكل منها مهمة
تخص
جهاز المناعة ، يحتوي على عدة غدد منها الغدد
إفراز مادة تخرف بالهورمونات ، تتدفق في الدم ، عند الهرمونات
تتراكم عدة خطوات في الجسم كالهضم ، الطلبية الجنسية ، العضوية
الجهاز العصبي ، يراقب الأعضاء الأخرى ، و يساعد الشرائح
التفكير

Students # 6

[Handwritten Arabic text - illegible]

Students # 7

Students # 8

.... يتركب جسم الإنسان .... عا عدد من الأجهزة المختلفة .. كل جهاز
له وظيفته . واجابة . و لكن للجمن منها يعمل معا . أجل الأجهزة هو
الهيكل العظمى ... الذي يدعم الجسم و يحمى . للأعضاء الداخلية .. يمكننا
الجهاز التنفسى من التنفس . و نقل ، ، لكن جين في الدّم .. و يشمل هذا
الأخير حول . الجسم من طريق الجهاز الدموى ... أيضا الجهاز
الهضمى ... فيمكننا من امتصاص الطعام الذي نحتاجة .. من أجل
النمو .. و تطرح الفضلات خارج الجسم . وادسطة الجهاز البولى ..
.... يتكون الجهاز الغد د ى من عدد مختلفة مثل ، غدة الدرقية ،
الجنسى . وعند الأدرينالين. و طريقة هذه الغدد هو إفراز كيميا وليست غالم
يدعوت بالهرمونات .. تراقب هذه الهرمونات مختلف العمليات في الجسم
مثل النمو و الهضم .. يراقب الجهاز العصبى الأجهزة ، الأخرى و يساعد
الكاشنات البشرية ، على المتفتكين
.... يتكون كل جهاز من أعضاء .. تعتبر الرئيسين مثل جزء من
الجهاز التنفسى . و تعتبر القلب جزء من الجهاز الجهاز الدموى .
و تعمل الكبد كجزء من الجهاز الهضمى و أجهزة أخرى ....
.... توجد كل عضو من أنواع مختلفة من الأنسجة ، و تحتوى الجلد
على البشرة ، و يشكل عضاء حول ، والأعضاء تعمع الأنسجة المترابطة
و تشمل أعضاء الجسم مع بعضها البعض و هو تحتوى على العظام .
الأنواع الأخرى للأنسجة هي ، الأنسجة الدهبية و الأنسجة الدموية .
.... تتكون كل الأنسجة من خلايا .. هذه الأع تعتبر هذه الأخيرة
صغيرة جدا و هى حيث ، أنها تقاس ، بآلاف الملمتر . و هى لا نرى
إلا ، بالمجهر .. وحظها تختلف كل خلية بشيء . و فيه الذي يدور حول نواة
و مسائل بتصرف بالمسئولة باتورم ، و الذي يدور . و تحتوى على جزيئات صغيرة
و كل واحدة لها و ظيفتها الخاصة
....

Students # 9

[handwritten Arabic text — illegible]

APPENDIX EIGT

Sample of students' translation Post –Test

Student # 1

والتهاب المعدة، أو أسباب

يمكن التعرف لهذا المرض من خلال تناول المواد السامة في المعدة

بتناول كمية كبيرة من الطعام في وقت واحد، عند مانك ن حالة

خالة خفيفة أو عندما نكون في فترة نقاهة من مرض حاد

* و أحيانا يمكن الإصابة بالمرض من خلال سوء في عملية

المضغ

تجب مراجعة الطبيب عند ظهور أعراض المرض و اتباع نصائحه

و العمل بها.

الأعراض:

يقصد بالتهاب المعدة حدود والتهاب على مستوى الغشاء المخاطي المعدة

أين يسبب آلام في شكل حروق في فم المعدة، تبقى أثناء الحلو

الشرب و أحيانا الأذواق

تصبح نبضات القلب من قليلة إلى خفيفة

يضعف المريض وقد يبكي عليه بيرودة قصوى.

تتسبب حركة الحجاب الحاجز آلام تؤدي إلى ضيق في التنفس

والعطاس أحيانا بالرغم من أن الماء المشروب مرتفع

انه الماء.

Student # 2

.

Student # 3

- بالمتهان المدرة .

كلمه أنسان جدا المصرف عن طريق تعاملى أى صادق والتى هى فى ذاتها تكون مسمومة
للمعدة ، من طريق تناول كميات كثيرة من الطعام مرة واحدة عندما يكون للمزاج
معكر ، وعندما نكون فى فترة قيامها من مرض عضال ولكن حدوث المرم من جراء
المصنع الخافض للطعام ان استدعاء الطبيب امر حتمى ولا بد منه عند ظهور أحد هذه
الخوارض ، وجب إتباع نصائحه حرفيا .

اعراض

ان السهاب المدة موضوعها رة عند المتهان العشاء المحانى المدرة مسبا إليئا واحترفى فى المدرة
المقبّ وعند الأمل أو الشرب ، واحيانا العراق حيث يصبح الضبض منخفضا حيث تكون
المريض شاحبا وسعن علمه ، والذى يسبب حركات الحجاب الحاجز و قريبا يكون
المتهدى قصيرا ومزنحجا والعطشة فى المدة مصرات على انة حال للماء المدرى
يسعدوف للقا اليامرة واحدة .

Student # 4

التهاب المعدة،

الأسباب : . يمكن الإصابة بالمرض من عدا طريق تناول أي مادة
سامة على مستوى المعدة ، وتناول كمية كبيرة من الطعام
في ذات الوقت ، حينما تكون التركيبة ضعيفة ، او في فترة
النقاهة بالنسبة لبعض الأمراض الحديثة / الخطيرة . وقد يصاب
بالمرض بسبب سوء مضغ الطعام ، فيجب مراجعة الطبيب في حال
ظهور الأعراض وإ تباع نصائحه بصرامة.

الأعراض : . التهاب المعدة : هو التهاب في الغشاء المخاطي للمعدة
مسببًا ألما على شكل حُرقة على مستوى فتحة المعدة وتقيأ عند
الأكل و الشرب وأحيانًا عند الغواق ..
يصبح النبض منيلًا وقليلًا ، ويصبح المريض مجهدًا أو يُغمى عليه
مع برودة شديدة ، كما تُسبب حركات الحجاب الحاجز ألما ما يؤدي
إلى قصور في التنفس اما في الإحساس بالعطش مع العلم ان
الماء الذي تم شُربه سيستفرغ في الحين.

Student # 5

القُرحة المعدة

الأسباب : يمكن الإصابة بالمرض عند أكل أي مادة تتكون لحدوا أيضا سامة عند أخذ الطعام بكميات كبيرة في آن واحد حيين أو عندما تكون مرحلة نقاهة من أمراض خطيرة. الإصابة بالمرض تكون أحيانا عند عدم المضغ الجيّد للأكل . يجب الإتصال بالطبيب عند ظهور الأعراض ويجب إتباع نصائحه حرفيا.

الأعراض : إلتهاب المعدة هو إلتهاب الغشاء المخاطي المعدة مسببا بذلك ألم أو احساس بالحرق في ــــــ في ــــــ المعدة ، القيء بعد الأكل و التعرب و أحيانا الطوائي.

تصبح النبضات قصيرة المدى و ضعيفة . المريض يصبح شاحبا و يغمى عليه مع برودة الأطراف و حركات الحجاب الحاجز الألم وكنتيجة نقص في التنفس وإزعاج ، والإحساس بالعطش كما أن الماء المشروب سُرجع مباشرة

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Student # 6

التهاب المعــــدة .

لا سباب . عند نهاب بهــذا المرض علنا تناول بعـضة الموادالتي قد تكون في جدنا ابقاء مواد سامة عند دخولها للمعدة ،،، و بسبب تناول كمية كبيرة من الاكل د فعة واحدة . عند مايكون في الحيوان في حالة ضعف او عندما تحدث مضاعفات .نادجة من بعض اعراض المعدة العوج كما عند ترجيم المرض عند سوء مضغ الاطعمة . وعند ظهور اعراض هذا المرض يجب الا حتمام بطعامي و لا تباع لارشاداته .

ونتيجت اعراض لالتهاب المعدى في التهاب العشاء ابطنا لاي المعدة مصاحبسب في حريرق على مستوى عنق المعدة ابطبع عند بزمج اثناء تناول الاطمة والشراب وفي بعض الاحيان يصبح دقات الدلب صعب قليلة وضعيف . كما عند بيئات المرض نأباء من المرد .

Student # 7

إلتهاب المعدة

الأسباب: يبقى الإلتهاب لهذا المرض يُساول أي مادة تكون في الـ إلا بزيادة . أو تناول كميات كبيرة من الأكل عندما تكون المعدة فارغة . أو عندما نكون هناك أعياء لأمراض الخطيرة . وقد تكون في بعض الأحيان بسبب هذا المرض سوء في منهج الأكل . من الضروري الإهمال فورا ما نطبيب منذ ظهور أول أعراض/الأعراض الأولى لهذا المرض ولا بد من اتباع إرشاداته بحذافيرها .

الأعراض : إن إلتهاب المعدة هو إلتهاب بحسب الغشاء المخاطي للمعدة ويتسبب بذلك في حروق في المعدة ، بما يؤدي إلى العطش عند الأكل أو الشرب وقد يتسبب في الأحيان في الإلتهاب بالأمعاء وأصبح دقات القلب مضرة وضعيفة، وطبعا يُرى الأعصاب بسبب اللون ومنعكفا كما يسمى بالرعشة . يتسبب حول ذلك الأعصاب والآلام ألمه بريح المعدة لها و يبند الفم الداخلي من العصب و بهذا ...

Student # 8

التهاب المعدة

الإصابة بالمرض يمكن أن تحدث بأخذ مادة هي حمض طبيعية تجودية للمعدة، عن طريق كمية مخصصة من الأطعمة دفعة واحدة خاصة إذا كانت مكوناتها فاسدة او إذا كانت اعتلفي م/ حالة تتعبه بعد مرض خطير واحيانا يحدث المرض إذا لم تصنع الأطعمة جيد يتوجب إستشارة الطبيب عند ظهور الأعراض ويتبع تعليماته حرفيا.

الأعراض: التهاب المعدة هو عبارة عن التهاب الغشاء المخاطط للمعدة يحدث لها يصفة حروق على مستوى المعدة، تفشى عند الأكل والشرب النفخات تهيج مضيقة المريض آمي، ودابل مع برودة الأطراف حركة الغشاء الحاجز تسبب لها مهايق دائل تنفس صعب.

Student # 9

ملخص

تتناول هذه الدراسة مشاكل ترجمة النصوص الطبية من اللغة الإنجليزية إلى اللغة العربية. وتستخدم هذا الغرض منهجا تقييميا لتحقيق ومناقشة مشاكل وتعقيدات ترجمة نصوص طبية من اللغة الإنجليزية إلى اللغة العربية. والغرض من هذه الدراسة هو عرض صعوبة ترجمة المصطلحات الطبية وكيفية التعامل معها من قبل طلبة السنة الأولى ما ستر في اللغة الإنجليزية. تسعى هذه الدراسة أيضا إلى التعرف على أهمية الفهم في قراءة النصوص لتحقيق ترجمة جيدة للنصوص الطبية. لإعطاء الاتساق في مرحلة تقييم، استخدمت استبيانين، استبيان موجه للطلبة و استبيان موجه للأساتذة. يهدف استبيان الأساتذة لجمع المعلومات عن تصوراتهم فيما يتعلق بالاستراتيجيات المعتمدة في ترجمة النصوص الطبية. و ويهدف استبيان الطلبة إلى جمع المعلومات عن الطلبة فيما يتعلق بخصائص النصوص الطبية والاستراتيجيات المتعلقة بترجمتها. و قد استخدمت في هذه الدراسة اختبارين. يطمح الإخبار الأول إلى تسليط الضّوء على الصعوبات التي يواجهها الطلبة خلال محاولتهم في إيجاد المصطلحات المناسبة و المرادفة للنص الطبي. كما يحاول تقييم استراتيجيات الطلبة في ترجمة النصوص الطبية. يهدف الاختبار الثاني تقييم استخدام الطلبة لاستراتيجية فهم القراءة تساعد في تحقيق ترجمة جيدة للنصوص الطبية. . توضّح نتائج هذا البحث أن استخدام الطلبة من استراتيجية الفهم تعزز فهم النص الطبي وإنتاج ترجمة فعّالة لنص طبي.

الكلمات المفتاحية : النصوص الطبية , الترجمة , مشاكل , استراتيجية الفهم

Résumé

Cette étude aborde les problèmes de traduction des textes médicaux de l'Anglais vers l'Arabe. Elle utilise une approche évaluative pour étudier et discuter les problèmes et les subtilités de la traduction des textes médicaux de l'Anglais vers l'Arabe. Le but de l'étude est d'afficher les difficultés de traduction des termes médicaux et comment ils sont abordés par des étudiants en première année master en Anglais. La recherche a également pour but à identifier l'importance de la compréhension du texte pour obtenir une bonne traduction des textes médicaux. Pour assurer la cohérence de la phase d'évaluation, deux questionnaires ont été utilisés, le questionnaire des enseignants et le questionnaire des étudiants. Le questionnaire des enseignants vise à recueillir des informations sur les perceptions des enseignants sur les méthodes adoptées dans la traduction des textes médicaux. Le questionnaire des étudiants vise à recueillir des informations sur les connaissances des étudiants concernant les caractéristiques des textes médicaux et les méthodes utilisées dans leur traduction. Deux tests ont également été utilisés: un pré-test et un posttest. Le but du pré-test est de décrire la traduction des élèves et de surligner les difficultés terminologiques rencontrées dans la traduction d'un texte médical. le test a également pour but d'évaluer les méthodes utilisés par les étudiants dans la traduction de textes médicaux. Le posttest vise à évaluer l'utilisation des élèves de la compréhension de textes pour obtenir une bonne traduction des textes médicaux. Le résultat de l'analyse a révélé que l'utilisation de la compréhension de texte génère des interférences qui améliorent la traduction des textes médicaux.

Mots Clés : Textes Médicaux, Traduction, Difficultés, Compréhension de Texte