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Overcoming the Scientific Translation Challenges: Examples from English into Arabic

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Abstract:

Translation is an act of transferring text from one language into another; this act requires some skills that can be divided into two types linguistic and extra- linguistic skills. As we live in globalization era which is characterized with the dominance of English as universal language of scientific inventions and communication, translation has a paramount role to contribute in the scientific dissemination. The scientific texts are considered as a challenge for the translator since they contain terms and scientific topics, to overcome these challenges the translator has to be familiar with terminology in one hand and with scientific topics in other hand. This article aims at shedding light on scientific language features, in addition to determine the different problems of the scientific translation, in order to establish approaches to scientific translation by analyzing translated scientific examples.

Key words: scientific translation, terminology, translation approach, extra-linguistic skills

1. INTRODUCTION

English is emerging as a universal language of science and technology; the statistics show the growth of scientific publication written in English in recent years,in their article Mario S. Di Bitetti and Julián A. Ferreras (2017)pointed out:

Within the last few decades, English became the dominant language of science, with more than 90 % of the indexed scientific articles in the natural sciences been published in this language (...). Researchers that want to communicate their results to the global scientific community seem to have no other option than to write and publish their articles in English. Having a lingua franca allows researchers from all over the world to communicate in one common language. (pp, 121-127)

There are lot of factors that led to the spread of English as an international language ,the main profound cause is the emergence of the USA as a powerful country after the World War II, because it was not destroyed during the second World War and it witnessed the immigration of the scientists seeking for the development of their researches ,in addition to the Cold War as a motivation to United States to encourage the scientific research. Moreover the technological development is considered as the most important factor of the use of English among the youth who prefer speaking and writing in it, the internet role cannot be ignored in large usage of English since it is the language of its invention.

It is noticed that the need for the scientific and technical translation into Arabic is getting increasingly important because many Arab countries are currently undergoing a large-scale modernization process.

In order to follow this technological and scientific development, Arab world need a serious movement of scientific translation. This later is not an easy task, although, it seems that the scientific translation is a simple substitution of terms in a certain field, but, in fact, it poses different kind of challenges where the translators face linguistic and extra linguistic problems, the aim of this paper is to reveal these problems and try to find strategies to solve them.

Theoretical framework

This article is divided into two parts theoretical part and the practical one

1-Specilised translation

Specialised translation is a recent branch appeared with the emergence of what is called in linguistics as Language for Specific Purpose (LSP) basing on knowledge Lerat argues that LSP is pragmatic notion since it is a natural language considered as a vehicle of specialised knowledge .The expression of specialised translation has been defined by several translation theorists. In their definition Wright and Wright (1993) made no difference between scientific or technical translation since the both are regarded as part of specialized translation,

> Technical translation encompasses the translation of special language texts, i.e., texts written using Languages for Special Purposes (LSP).As such, technical translation (and "technical terminology" as well) includes not only the translation of texts in engineering or medicine, but also such disciplines as economics, psychology and law.(p1)

Similar to them Ghazala explained that there is no distinction between the technical and scientific translation the both are positioned under the specilised translation "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" (1995, p156).

The term specialised translation, also referred to as LSP translation, where LSP stands for Language for Special or Specific Purpose can be considered as the translation of texts dealing with subject-specific knowledge, using specialized terminology, having a particular communicative purpose and addressing a specific audience.

In general it refers to the translation of specific field that requires specialized knowledge.

2-Scientific translation

It has been already mentioned that Ghazala classified scientific and technical translation as specialised translation; he also determined its aim to transmit scientific information from SL into TL. Also, it deals with texts on subject based on applied knowledge

from the natural sciences. Each field of science has its specific language so it is a must for the translator to have a specific scientific background which allows him to translate from one language into another. The translator of Mathematics for instance, needs to know the mathematical terms and abbreviations. the message and information form the spirit of the scientific text which translator must reflect in his target text; unlike the literature translation in the scientific one, the translator focuses on the information rather the esthetic aspects , in this type text is qualified as pragmatic text where the information is the dominant aspect(Delisle,1980,p22) .

Byrne (2006) agrees with Delisle and claims that, scientific translation primary goal is to deliver scientific information; it aims at presenting well expressed information, that may be used easily, properly and effectively. He referred to scientific translation as a communicative service, which offers new information for new audience, since scientific translation is regarded as communicative service; it certainly involves three main people, which are the author, the translator and the reader. He added also, that it is much more than just rendering source text language and style. Its main concern is to ensure delivering information accurately and correctly, in that it ensures that the reader may use this information easily. Technical translation can thus be understood as the translation of texts about how scientific knowledge is put to use.

3-Characteristics of scientific texts

In scientific works, the topic takes priority over the style which aims at expressing facts, experiments, etc. The reader of such scientific works does not read it for any pleasure which a reader of literary work usually seeks, but he reads it to find information it contains. Scientific words differ from ordinary and literary words since they do not accumulate emotional associations and implications

This explains why the translation of a scientific work is supposed to be more direct and much less artistic than the other kinds of prose. The language of scientific and technical language is characterised by impersonal style, simpler syntax, use of acronyms, and clarity. The aim of the distinction between scientific and literary texts is to guide the translator to

possess the subject matter and concentrate on it instead of style. The scientific and technical texts are characterised as follow:

Non-figurative Language:

Scientific text underlines the information without bothering about features that are characteristic of poetic texts, such as rhyme, connotative and symbolic meanings. This idea is set by Newmark "it is usually free from emotive language, connotations, sound-effects and original metaphor" (1988, p151).

Use of Passive in Scientific Writing:

Passive Voice is one of the most well-known features of scientific writing. This is frequently used in scientific writing to create an impersonal scientific text. In order to remain objective and impersonal, the technical writers choose passive form because the importance is given to the information (invention or discovery) rather than who did something. Newmark added other grammatical features such as the use of nominalization, third person and present tense ((1988, p151).

Use of Nominalization:

Scientific texts writers prefer representing events and qualities of objects not as verbs, adjectives, and adverbs but as nouns. Nominalization allows the scientists to pack complex information into a compact unit. Halliday (1988) claimed that

There has been an evolution towards increasing nominalization in scientific writing.

For example: 1-The temperature increases sharply

Noun Verb Adverb

In this sentence the subject is a Noun and the verb a material process which may also be expressed as: A sharp increase in temperature

Adj Noun NA

In this sentence the verb 'increase' has been nominalized and the adverb 'sharply' has become an adjective in theme position.

2-Qualities can also be nominalized. For example:

'An electron moves in an orbit' becomes 'the orbital motion of an electron' (pp162-178)

Universality: Jameel explains that the terminologies used are accepted because they are results of experiments and based on reason and rationale. Scientists use English to realize universal sets of concepts, methods, and procedures which are independent of social and cultural influences. (2012, p51)

Terms: a word or expression used in relation to a particular subject, it is one of the main features of scientific text; according to the Oxford Compact dictionary (2011) the special words and expression that are used in particular profession, subject. This idea is further explained by M. Teresa Cabre(2010)

> Terminology, as a field of knowledge, deals with the study of terms. Like any subject, terminology has its applied side, which can be found basically in the collection, analysis and, in some cases, standardizing of terminological units in glossaries or databases. (pp, 365-357)

She has compared between translation and terminology and indicated their common points as follows:

> Firstly, terminology and translation are characterized by their long tradition as applied subjects, in contrast to their recently established character as disciplines. Terminology and translation arose from the Firstly, terminology and translation is characterized by their long tradition as applied subjects, in contrast to their recently established character as disciplines. Terminology and translation arose from the practical activity caused by the need to express specialized thought or to solve comprehension problems. Second, (...), both translation and terminology try to advance in the reaffirmation of their status as disciplines by placing emphasis on the features that distinguish them from other subjects and adhering to theories which sustain their autonomous nature as fields of knowledge. Thirdly, terminology and translation are interdisciplinary fields having a cognitive, linguistic and communicative basis. (...) Besides, both subjects are information and communication areas which have knowledge categories and units expressing them that are projected on communicative acts immersed in particular social contexts. Last but not least, language is the essence of both disciplines. (p356)

To sum up, scientific texts are texts addressed to certain community either specialist in precised field where they share the same knowledge or educated and non-specialist people who prefer reading and following science. These characteristics can be divided into two types linguistic features such as passive voice, present tense etc. besides to extra-linguistic like the new usage of words or terms that bear a scientific meaning as well, in addition to the topic itself containing scientific information, therefore the translator faces two types of challenges ;linguistic and extra-linguistic difficulties .Basing on these features and challenges the researcher tries to find models and approaches dealing with the scientific translation problems.

5-Scientific translation approaches

The difficulties found in the scientific text are due to the specialized information and knowledge it contains, therefore it is incorrect to consider the scientific translation as set correspondences of scientific terms, if it is so it is enough to use a bilingual dictionary to solve terminological problems, Durieux argues that the translation of these texts requires a clear strategy not only because of the scientific content but also due to the language used by the specialists to facilitate their communication .(2010,p24)

5-1 Interpretative theory (theory of sense)

The Interpretive Theory of Translation known as the "Theory of Sense" was developed by the researchers (interpreters and translators) Danica Seleskovitch and Marianne Lederer ,it was an originally method of translation of pragmatic texts of general interest for translator's apprentices, but its first emergence was as a process for the interpreting then it was expanded to be applied in translation, the last two factors make it pertinent for the scientific texts translation where the translator emphasis on the information and knowledge. For a better understanding of the translation process, "translating is not transcode but understand and express meaning"(Lederer, 1994, p19). The well-known principle of this theory is understanding to make others understand, for that reason, the comprehension of the source text is classified as the first step flowed by other steps of deverbalization and re-expression, the receiver of the message must have extra-linguistic, language skills, and a "cognitive

baggage" that encompasses the knowledge of the world, the seizure of context and understanding the "intention" (le vouloir dire) of the author. According to Lederer(1994,212) , cognitive supplements are under factoring, notional and emotional, cognitive and cognitive baggage context that combines the linguistic meanings of texts to form the whole meaning . In her book titled "fondements didactique de la traduction technique » Christine Durieux(2010,39) set up principles to help the translator in the comprehension stage she claims that the essential characteristic of this approach is the comprehension efforts before rewriting in the target language the content of the source text ,the effort consists of the reading operation of the whole source text for finding the message meaning ,Durieux divided the translation operation into two phases :

A-Comprehension phase

Unlike the texts discussing ordinary topics, the scientific texts necessitate a complex comprehension operation which includes at first, decoding linguistic units, then highlighting to which realities they refer to, after that synthetizing understood points relating them to acquired knowledge finally, finding the meaning. (Durieux, 2010, 71)

She emphasizes that the aim of this stage is to highlight the content and the information found in the text. She also explains this stage by giving procedure named Documentary research; it consists of reading books or magazines written in both source and target language. She considers the documentary research in source language as a procedure to clarify and explain certain notions but it does not help the translator to reconstruct the source text into the target language, even though it is a strategy must not be ignored mainly if the translation is from the mother into a foreign language since in this case the information is easily achieved, in other side, studying a same topic in documents written in the both languages ,in a condition one of them is not a translation of the other text ; hence it is two text written in their source language treating the same scientific topic, this strategy helps the translator to enhance his extra linguistic skills by:

1- understanding the topic as this later is discussed in different ways in documents written in foreign language which can be completed by reading the same topic in the mother language or vice versa

2- Being a familiar with the topic and its terminology

3- Finding the terms employed in their context to avoid the translation by corresponding. (Durieux, 2010, pp56-57)

B-reconstruction phase

In this stage, the translator task is to write in the target language what he has understood in the source text without being close to its form and structure the worry of the translator is to render the source text meaning respecting the rules (servitude) of the target language(Durieux,2010,p80)

Moreover, she emphasizes the reconstruction depends on two factors as follows:

The translator himself and the addressee

- The translator: he is the responsible who choose the final form and structure, although his style will reflected in the target text but he is asked to respect the author the translator has to remember that his role is not determined by rendering the informative function of the text but he also transfers the tone and the language level of the source text, since he is repeating what was written
- The addressee: the function of the translator is not restricted in repeating the original author, but he has also to make him be read.
- The addressee is one of the factors of choosing the final structure to express naturally the translator take into consideration the text type and of course the addressee.(Durieux,2010,pp84-86)

On the whole, the interpretative theory is based on the meaning of source text, in this theory translation is considered as complex operation which is not limited at surface level of the text I.e. linguistic level, in contrary ,the translator must be independent of the source text linguistic aspects to reconstruct the meaning in the target language ; in this theory the meaning challenge is solved by the documentary research this later can provide the translator with an extra- linguistic background or what is called cognitive supplements through enlightening the context of the scientific terms and their usage. Moreover, translation of science poses a huge linguistic challenge. The key feature of scientific texts is terminology which is considered a key principle in scientific knowledge. Terminology and

science have been interwoven for a long period of time. The relation between terminology and science is even more strongly understood by seeing an intrinsic dependency of the development of language and the development of science.

5-2 Newmark theory

In his turn, Peter Newmark studied the scientific and technical text and has set up his approach.

He distinguishes two kinds of translation; semantic translation and communicative translation. The semantic translation focuses on replicating the source text forms within the target language. It denotes formal correspondence between the source text (ST) and the target text (TT). It focuses on the phonetic, morphological and lexical structure of the text. Semantic translation is used in genres which are ST-biased. It is rendering of the contextual meaning of the ST according to the syntactic and semantic characteristics of the TT; "it must take more account of the aesthetic value (...) of the SL text"(Newmark,1988,p46). It is similar to Nida's formal correspondence which focuses on form and content. It is author-centered, faithful, more literal than informative.

B-Communicative Translation of Scientific Texts

On the contrary, communicative translation aims at influencing the reader. It is reader-centered and effect-oriented. Newmark proposes the principle of "equivalent effect". According to Newmark, it focuses on making the target language readers understand the source language author's thoughts "communicative translation attempts to render the exact contextual meaning of the original in such a way that both content and language are readily acceptable and comprehensible to the readership" (Newmark, 1988, 47). It is used in genres which are communicative in nature such as news report, textbooks, and public announcement.

The differences between communicative and semantic translation are based on their different emphasis. In semantic translation, the focus is on the original's formal properties. However, communicative translation does not adhere to the source language text. Then, it attempts to eliminate any exoticism and to look natural; smooth translation. While

communicative translation attempts to produce on its readers an effect close to that of the original, semantic translation aims to render the semantic and syntactic structures of the original.

Semantic translation is usually more awkward, more detailed, more concentrated, but briefer whereas Communicative translation is easy reading, more natural, smoother, simpler, clearer, more direct, andmore conventional.(Newmark,1991,p11)

He(1991) states further:

> As pointed out by Newmark, communicative and semantic translation may well coincide.... There is no one communicative or one semantic method of translating a text—these are in fact widely overlapping bands of methods. A translation can be more, or less, semantic—more, or less, communicative—even a particular section or sentence can be treated more communicatively or less semantically. (p10)

For the semantic translation, he suggested some techniques that allow to the translator focusing only on the source text, among these techniques:

- TRANSFERENCE: Transference (emprunt, loan word, transcription) is the process of transferring a SL word to a TL text as a translation procedure. It is the same as Catford's transference, and includes transliteration, which relates to the conversion of different alphabets .....the word then becomes a 'loan word'.
- NATURALISATION: This procedure succeeds transference and adapts the SL word first to the normal pronunciation, then to the normal morphology (word-forms) of the TL.
- THROUGH-TRANSLATION: The literal translation of common collocations, names of organisations, the components of compounds (e.g. 'superman1, Ubermmsch) and perhaps phrases (compliments de la saison^ 'compliments of the season'), is known as calque or loan translation. I prefer the more transparent term 'through-translation'. (1988:81-85)

In discussing the scientific translation he (1988) establishes principles that do not differ from the interpretative theory principles, thus he explains his approach.

> When you approach a technical text, you read it first to understand it (underline difficult words) and then to assess its nature (proportion of persuasion to information), its degree of formality, its intention (attitude to its topic), the possible cultural and professional differences between your readership and the original one. Next, you should give your translation the framework of a recognised house-style, either the format of a technical report adopted by your client, or, if you are translating an article or a paper, the house-style of the relevant periodical or journal. (p156)

He agrees with the previous theory in some point such as

- Comprehension of the source text.
- Take in consideration the reader of the target text.
- Reconstruction respecting the accepted conventions and style of the target language.

Finally, he (1988) presents his advice to the translator to be up to date.

> My last point is obvious. Technology being an explosion, escalating exponentially, ongoing, this is the field, on the frontier of knowledge, where you have to be most up to date. Data banks, terminology bureau, informants, the latest editions of all text- and reference books - nothing else will do. (p160)

Practical framework

In this part, the study attempts to investigate the procedures and strategies used in the scientific texts. The researcher adopted a comparative analysis to compare between the SL and the TL equivalents which are provided.

The corpus: The corpus has been chosen is an article titled "The kill-switch for CRISPR that could make gene-editing safer" by Elie Dolgin ,from the Nature Magazine written in English then translated into Arabic . The choice is based on the scientific document that contains texts and terms which serve this study. The topic discussed is biological, besides to the scientific terms; it is rich of scientific structure that is why the researcher adopted a comparative analysis approach to compare between the SL and the TL equivalents and correspondents which are provided.

1-Corpus analysis:

After the study of the long articles, the researcher tried to identify the Newmark procedures used by the translator in order to overcoming the linguistics and extra-linguistics challenges. The aim of this analysis is also to examine the interpretative theory principles that agree with Newmark in the scientific background of the translator and the independence of the source text to restructure it according to the target language conventions of writing and the type of addressee.

A-Communicative translation

Table 01 examples of Communicative translation

Source text	Target text
1. he was right	1ثبت أنَّه كان على صواب.
2. :colon	2.ف
3. The intruders survived.	3تمكنت تلك العاثيات الدخيلة من النجاة.
4. the bacteria vulnerable	4ما يجعل البكتيريا عرضةً للإصابة بالفيروسات
5.These proteins serve as the rocks to CRISPR's molecular scissors	5وهذه البروتينات بمثابة الصخرة التي تتحطم عليها المقصّات الجزيئية لأنظمة «كريسبر»
6. Provides scientists with a toolkit for keeping gene editing in check.	6تزود العلماء بمجموعةٍ من الأدوات للإبقاء على تقنيات التعديل الجيني قيد السيطرة
7. Some are using these proteins as switches	7ويَستخدم بعض العلماء حاليًّا هذه البروتينات كمفاتيح
8.. Yet, despite a growing number of proposed applications and proof-of-concept experiments in the laboratory, researchers have yet to pin down the therapeutic potential of these anti-CRISPR systems	8ورغم العدد المتزايد من التطبيقات المقترحة لأنظمة «مضادات كريسبر»، وتجارب إثبات جدواها في المختبر، ما زال يتعين على الباحثين استكشاف إمكاناتها العلاجية.خارج عن السيطرة.
9. Full stop	9وفي هذا الصدد
10. on everyone's lips	10على ألسنة الجميع
	11جدل مستعِر

11. All hell breaks loose	12فإنّ الاكتشاف الأوّلي الذي توصل إليه
12. The initial discovery by Davidson and his students flew under the radar.	ديفيدسون وطلابه ظل بعيدًا عن دائرة الضوء
13. Especially given that the anti-CRISPR proteins discovered were all specific to one particular form of bacterial defence, known as the type I CRISPR system. The darling of genome editing has been the type II system and its archetypal DNA-cutting protein, Cas9.	13خاصةً لأنَّ جميع البروتينات المضادة لأنظمة «كريسبر» التي اكتُشِفها الباحثون كانت ترتبط بنوعٍ معين من الدفاعات البكتيرية، يُعرَف باسم «النوع الأول من أنظمة كريسبر». أمَّا النوع المفضل لدى الباحثين في عملية تعديل الجينوم، فكان النوع الثاني، وبروتينه التقليدي المُستخدَم لقطع الحمض النووي، المعروف باسم «كاس 9.«
14. “it had to be Cas9”.	14كان لا بد للأمر أن يتعلق ببروتين كاس 9."
15. the thin edge of the wedge comes in,	15فإنّ أيّ تطورٍ بسيط... يندلع على أثره فجأة جدل شاسع مستعر."
16. anti-CRISPR proteins	16البروتينات المضادة لكريسبر
17.: they showed not only that delivering AcrIIA4 into human cells, either alongside or right after introducing Cas9, could halt gene-editing activity in its tracks, but also that it could limit the ‘off-target’ effects that researchers and investors have fretted over since early in CRISPR’s development5.	17إذ أثبتوا أنَّ تزويد الخلايا البشرية ببروتين AcrIIA4يمكنه تعطيل نشاط التعديل الجيني5، سواءً فعلوا ذلك بعد تزويد الخلايا ببروتين «كاس 9»، أم في الوقت ذاته.
18. Not immune to challenges	18تقنيةٌ غير منيعة
19. Because of previous exposure to microbes harbouring CRISPR–Cas systems, many people have immune systems that are already primed to attack and disable the Cas9 protein	19يمتلك كثيرٌ من الأشخاص أجهزةً مناعية مهيَّأة بالفعل لمهاجمة بروتين «كاس 9»، وتعطيله، وذلك نتيجة تعرُّضهم في السابق لميكروباتٍ تحتوي على أنظمة «كريسبر-كاس».

B-Semantic translation

Table 02 examples of Semantic translation

Source text	Target text
1-Bacteria	1-بكتيريا
2-Viruses	2- فيروساتٍ
3-bacterial defence system	3-نظام الدفاع البكتيري
4-gene editing	4-للتعديل الجيني
5the bacterial genome	5-جينوم البكتيريا
6-DNA sequences	6تسلسلات الحمض النووي
7-Applications-medicine	7تطبيقات-الطب
8-Molecules	8_الجزئيات
9-inhibitors	9مُثبطاتٍ
10-mechanism	10الآلية
11-cells	11الخلايا
12 Despite the growing focus on	12رغم التركيز المتزايد على
13 to more finely control the activity of CRISPR systems	13، للتحكم بدقةٍ أكبر في نشاط أنظمة «كريسبر»
14-That could pose a challenge	14وهذا قد يُشكِّل تحديًا
15-Microbiologist	15عالِم الأحياء المجهري
16-phage biologist	16المتخصص في بيولوجيا العاثيات
17-Biotechnology	17التكنولوجيا الحيوية
18-microbial genomicist	18المتخصص في علم جينومات الميكروبات
19molecular biologist	19عالِم البيولوجيا الجزيئية

3- Analysis interpretation

This section deals with examples from the English-Arabic translated scientific article. First, examples of the table 01 offered to point out the use of communicative translation strategies.

As mentioned above the translator in the communicative translation emphasizes on the reader and the information. Of course, communicative translation is not meant to be better than semantic translation. The choice of translation strategy depends on specific conditions. One finding of the study is that choice of translation strategy depends on the communicative value of the text. It plays a role in determining the translation strategy used; i.e., text type, readership, the roles of translators, and functions of the texts. With regard to readership, if priority is given to audience, communicative translation is used; if priority is given to author, semantic translation is used. The function of the text is also important. Scientific texts have informative function. The study stresses that the communicative value of the text is important to determine the translation strategy. As for text type Newmark(1988,p40) proposes three text types: namely, expressive texts, informative texts and vocative texts. According to him, communicative translation is preferred in scientific texts because they are informative. He regards communicative translation as smother and simply clearer, while semantic translation is viewed as awkward, more detailed and more concentrated.

The communicative translation provides the translator with the strategies which help him to overcoming the extra- linguistic challenges mainly the difficult scientific concepts; in this case the translator can paraphrase e.g:

4-The bacteria vulnerable. ما يجعل البكتيريا عرضةً للإصابة بالفيروسات

He has explained the sentence by adding verb and subject explicitly respecting the Arabic structure.

9-the function of the punctuation mark full stop (.) is explained by the expression في هذا الصدد

14- "It had to be Cas9". كان لا بد للأمر أن يتعلق ببروتين "كاس"9

It is an expansion by adding (Newmark, 1988, p90) كان لا بد للأمر أن يتعلق ، to make the sentence suitable to the Arabic conventions.

Another expansion in the following example

12- The initial discovery by Davidson and his students flew under the radar. فإنّ الاكتشاف الأوّلي الذي توصل إليه ديفيدسون وطلابه ظل بعيدًا عن دائرة الضوء

The translator has transferred the preposition "by" by an Arabic expression " الذي توصل إليه"

18- Not immune to challenges تقنيةٌ غير منيعة

The word "challenges" is changed in the subtitle focusing on "technique"تقنية as a solution to the problems faced by the scientist; hence the translator preferred the equivalent expression to clarify what will come after. There is equivalence in the example

11- All hell breaks loose جدل مستعر

For the semantic translation (table 2) where the translator emphasizes on the source text, there are strategies such as:

Transference (Transliteration) follows the phonetic rules of the target language. Transliterated words are often naturalized to assimilate the structure of the target language

1. Bacteria بكتيريا
2. Viruses فيروسات

The correspondence term in the Arabic

9 Inhibitors مُثبطاتٍ

10 Mechanism الآلية

The trough translation

3 bacterial defense system نظام الدفاع البكتيري

6 DNA sequences تسلسلات الحمض النووي

14 That could pose a challenge وهذا قد يُشكِّل تحديًا

12- Despite the growing focus on رغم التركيز المتزايد على

It is noticed that, in the semantic translation, the translator could solve the terminology challenge by opting for transliteration, trough translation (calque) procedures and rarely the correspondence (formal equivalence), the resort to this procedures is due to numerous reasons especially globalization Cronin explains that

translators, like everybody else, are susceptible to the influence of globalization. Since globalization cancelled space, it seems to be synonymous with instantaneous communication. This impact is especially on non-literary texts or scientific texts. Globalization has imposed the rapid flow of scientific and technological terms. (Cornin, 2003)

4-Conclusion

In the globalization era, English is considered as the language science which has an influence on the Arabic world scientific research. Translation is the only way to follow this development.

The scientific texts with their features exert an influence on the translation procedures choice; they have common points with all kinds of texts in the process of reading, understanding and rewriting.

However, they have their special strategies: before translating, the translator needs to collect information about the topic of the text by conducting a specilised research. The translation approaches have provided the translators with procedures such as paraphrasing, expansion, equivalence, transliteration and correspondence , moreover the translator has to master the writing convention; in addition, he takes into count the audience and the information highlighted in the text.

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