Challenges in Translating Scientific Texts: Problems and Reasons

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Abstract—The demand for scientific and technical translation has increased because of the rapid scientific and technological development in developed countries and the need to spread these sciences and technologies in developing countries. This study aims to investigate the main problems encountered by translators in translating scientific texts from English into Arabic and reveal the main reasons behind these problems. In this study, a qualitative research design is applied, and the sample of this study consists of one scientific text with (938 words) translated by twenty BA students. The study reveals that translators faced lexical and syntactic problems while translating scientific text, such as word diction, preciseness, terminological consistency, word order (markedness), agreement, tense and aspect, and passive structure. Moreover, the study shows that a lack of translators' experience in this domain, students' total dependence on a literal translation, and the lack of awareness of the sensitivity of scientific texts are some of the most important reasons for these problems.

Index Terms—scientific translation, terminology, problems, English, Arabic

I. INTRODUCTION

Science and technology play a tremendous role in our lives. They are closely linked with aspects of society and human civilization's progress. The rapid development in scientific and technical fields has led to the growing demand for the technical translation since most products are published in English as a universal lingua franca. In this light, a technical translation could be viewed as one of the essential branches in the field of translation since what we have seen today is that approximately 90% of the translations on the global market are technical ones (Kingscott, 2002). However, dealing with such specialized texts is not easy because several issues and factors affect these texts, such as style and terminology (Al-Abbas & Haider, 2021). Farghal (2009) states that translating any text from one language into another may encounter many linguistic problems due to the structural variations between Arabic and English regarding vocabulary and syntax and the lack of linguistic knowledge of translators, which is the core of the translation competence.

According to Bell (1991), the notion of translator competence entails a lot of meanings which are; target-language knowledge, text-type knowledge, source-language knowledge, subject area ('real-world') knowledge, contrastive knowledge, and 'communicative competence' (covering grammar, sociolinguistics, and discourse). However, PACTE (2000) states that translation competence is built upon six subcomponents: communicative competence, extra-linguistic competence, psycho-physiological competence, transfer competence, and strategic competence. Therefore, the translator's competence in both languages (ST and TT) is a prerequisite to producing an appropriate text in the target language. This study aims to answer the following questions:
1. What are the main problems encountered by translators in translating scientific texts?
2. What are the main reasons behind these problems?

II. LITERATURE REVIEW

A. Scientific Translation and Requirements of Scientific Translator

With the development of science, scientific translation is considered one of the most important branches in the field of translation nowadays. According to Ghazalla (1995), scientific translation is mainly the process of rendering terms from one language into another in the fields of science and technology from different domains such as medicine, physics, chemistry, mathematics, and computer sciences. In a similar vein, Byrne (2006) states that a scientific translation could be related to science which the Chambers Dictionary defines as "knowledge ascertained by observation and experiment, critically tested, systematised and brought under general principles" (Chambers, 1992). In other words, scientific translation deals with pure science at all levels: "theoretical", "esoteric," and "cerebral glory" (Byrne, 2006, p.8). In addition, Byrne (2006) determines three essential characteristics: the subject matter, type of language, and purpose to distinguish this branch of translation from others, such as the technical one.

The development of science in developed Western nations and the emergence of new scientific terms may create problems to find equivalents for them. Nida (1964) states that rendering scientific terms that appeared in advanced western countries to languages of third-world developing countries could be a problematic task. This is due to the fact that the main aim of scientific and technical translation is not only to deliver the translated information correctly and

accurately from the SL into the TL but also to convey it in such a way that ensures recipients understand the information easily, properly, and effectively (Byrne, 2006).

Thivierge (2002) sheds light on the role of the translator in rendering any scientific text. He states that "the work of scientific translators is to achieve one primary goal: to write information in a clear, concise, and accurate manner" (Thivierge, 2002, p. 188). Furthermore, He determines nine requirements that any scientific translator should observe, which are: working appropriately for the target receivers, preserving the author's choices in the ST, understanding sciences, and having complete background information related to the ST, mastering the SL and the TL, asking constructive questions, working appropriately for publication, learning current practices, and delivering the product on time.

Similarly, Byrne (2006) investigates the requirements of scientific translators and their roles in the rendering process. He concludes that the scientific translator has a communicative role via the translated text since he should draw information about the text from different resources to ensure the correct understanding of the original text and then transfer it to the second language so that the recipient also understands. Byrne (2006, p. 17) adds,

> … The need for translators to conduct research so as to understand not just the text but also the subject while at the same time ensuring, by means of revisions and corrections, that the text conforms to target language norms and target audience expectations.

B. English- Arabic Scientific Translation

Rendering scientific and technical texts to the Arab World could reveal many linguistic issues. One of the most problematic ones is terminology and translation. Seiny (1985) mentions that Krollman (1976) states that terminology is responsible for about 40 to 60% of technical translator's errors, and finding the adequate equivalent term takes up about 50% of the translator's available time. Accordingly, it is natural for the agencies included in the Arabization of scientific terms to solve this problem before anything else (Sieny, 1985).

Following the same sense, Al-Hassnawi (2010) considers the translation of scientific terms as a "*real intellectual challenge*" that needs several requirements, such as skills, intelligence, and mastery of both the SL and the TL. Cabré and Sager (1999) define the terminology based on three levels; field, practice, and product. He states that "as field, terminology is a subject which is interested with specialized terms; as practice it is the series of principles oriented across term classification; finally, as product, it is a set of terms from giving subject field" (Cabré & Sager, 1999, p.8). Thus, Byrne (2006) concludes that terminology is the first noticeable part of any technical text and the fuel for transferring the text between languages.

Yowell and Lataiwish (2000) classify technical terms into two types; cross-cultural recognized terms and cultural specific terms. While the former deals with universal terms, i.e., terms that do not belong to a particular culture, the latter deals with terms that are specific and belong only to one language, i.e., the grammar terms and cultural specific terms which cause critical problems in translating texts.

C. Translation Equivalence

Comparing texts among different languages can be the main drive behind the appearance of equivalence theory. The emergence of this new notion causes many problems and heats the debates in the field of translation. Many theorists, such as Vinay and Darbelnet (1958), Jakobson (1959), Nida (1964), Catford (1965), House (1977), and Baker (1992), introduced different points of view regarding this concept based on different translational approaches (Leonardi, 2000).

According to a definition provided by Vinay and Darbelnet (1958) (in Kenny, 1998, p. 342), an equivalence-oriented translation could be viewed as a procedure which "replicates the same situation as in the original, whilst using completely different wording". Furthermore, they demonstrate that using such a procedure during the translation process will preserve the impact of the style used in the ST in the TT. Thus, based on their study, the method of equivalence is the optimal method to translate proverbs, idioms, clichés, and nominal or adjectival phrases.

However, Jakobson (1959) addresses the notion of "equivalence in difference," which is considered a revolution in the field of translation. He relies on his semiotic approach to classify translation into three main types, which are intralingual (within one language by paraphrasing and reordering), interlingual (between two different languages), and inter-semiotic translation (between sign-languages' systems). According to him, interlingual translation forces translators to utilize synonyms to convey the message embedded in the ST, meaning that there is no full or exact equivalence between code units. He acknowledges that "translation involves two equivalent messages in two different codes". i.e., although languages differ from one another in a grammatical point of view, the task of translation is still possible.

Leonardi (2000) claims that both Vinay and Darbelnet's (1958) procedure and Jakobson's (1959) theory emphasize that the translator is a decision-maker in the process of translation. When the translator feels that the linguistic approach is no longer appropriate to do the task of translation, he embarks to apply other procedures, such as loan translations and neologisms.

However, Nida (1964) distinguishes two different types of equivalence; formal and dynamic. While the formal equivalence aims at focusing attention on the form and the content of the original text, dynamic equivalence emphasizes the creation of the same equivalent effect on a target reader, i.e., the principle of equivalent effect. In his study, Nida (1964) determines three basic requirements that should exist to achieve a successful translation, which are: utilizing

natural expression, creating equivalent response (reader-oriented), and conveying the manner and the spirit of the original text (author oriented).

At the same period, Catford (1965) adopts different translation equivalence and develops a linguistic-based approach to translation. He differentiates between two types of equivalence, formal and textual, based on the functional linguistics of Halliday. According to the types mentioned above, translation is defined by Catford (1965, p. 20) as "the replacement of textual material in one language by equivalent textual material in another language". He illustrates that textual equivalence ranges between linguistic and contextual features.

It is worthy of mentioning here that the most significant achievement made by Catford in 1965 is the introduction of the translation shifts, where he defines them as "departures from formal correspondence in the process of going from the SL to the TL" (Catford, 1965, p.73). According to him, translation shifts could be classified into level shifts and category shifts. The second type falls into four levels; structure-shifts, class-shifts, unit-shifts, intra-system shifts.

House (1977) studies the semantic and pragmatic equivalence by highlighting the importance of the function of ST and TT. She demonstrates that the original and translated texts must have the same function determined by the situation in which the original text is embedded. House (1977) acknowledges that if the situational features of the ST differ from the TT, it is impossible to have the same equivalent function. Therefore, the quality of the translational product will not be high enough.

Finally, since the notion of equivalence has been a controversial field of discussion, it has been modified differently according to different linguistic levels such as grammar, texture, pragmatics, and others (Leonardi, 2000). In her work, Baker (1992) believes that the concept of equivalence can be defined upon certain conditions. It can be studied at different levels, including all various features of translation combining the linguistic and communicative approaches. She differentiates the following forms of equivalence:

1. Equivalence at the Level of Word and above the Word

In her viewpoint, Baker claims that any translator should consider the equivalence of word-level as a first element. Many translators begin their work by looking for terms in the TL that directly give the equivalent of single words in ST. Baker defines this term because sometimes, the same word can be used to provide different meanings in different languages. She also attracts the translator's attention to some factors when dealing with a single word. These factors are number, gender, and tense.

2. Grammatical Equivalence

Baker claims that sometimes there could be some differences in the grammatical structures between the SL and the TL. These differences may encourage the translator to delete or add information in the TT because the TL itself lacks specific grammatical devices. In this regard, she is interested in number, tense, aspect, voice, person, and gender.

3. Textual Equivalence

It is a form of equivalence that pays attention to information and cohesion between the ST and the TT. Although translators have the option to preserve the cohesion and the coherence of the ST or not, they have to consider the following factors: the target audience, the purpose of the translation, and the text type.

4. Pragmatic Equivalence

It is the form of equivalence that works on the author's intentions rather than their words. The translator, in this regard, has to be aware of the target context in order to convey the author's message in a method that the TT readers can clearly understand.

As demonstrated earlier, the notion of equivalence causes a problematic issue in the field of translation. Therefore, different scholars discussed this notion from different viewpoints to shed light on the importance of this concept to have a successful translation.

D. Translation Strategies

Many scholars have conducted many studies to examine translation strategies; such topic is discussed according to their points of view (Al-Khalafat & Haider, 2022; Al-Abbas & Haider, 2020; Debbas & Haider, 2020). However, most of them look at translation strategies as techniques, procedures, or methods used by translators to overcome any translational problem (Owji, 2013). Chesterman (1997) states that translation strategies suffer from "considerable terminological confusion", and he believes that these strategies have general features:

1. They involve text manipulation
2. They must be applicable
3. They are goal-oriented
4. They focus on the problem
5. They can consciously be applied
6. They must be empirical and understandable by the readers in addition to the person who uses them.

Although many scholars offer different definitions and classifications for the translation strategies, this study is concerned with the classifications of translation strategies introduced by Vinay and Darbelnet (1958/1995) and Baker (1992).

According to Vinay and Darbelent's (1958/1995) point of view, there are two methods of translation: direct/ literal translation and oblique translation, which can be used when the direct translation is impossible because of lexical and

syntactical differences between the two languages. In addition, oblique translation includes seven subcategories which are:

1. Borrowing:

It is a strategy used when there is a gap between the SL lexicon and the TL one. In such a case, translators may transfer the SL lexicon directly into the TL. For example, rendering religious terms, such as "إمام, جهاد, حج" into English as "*hijj*", "*jihad*", "*Imam*".

2. Calque:

Firstly, it is a special kind of borrowing where the form of the SL expression is borrowed into the TL, then all elements and components of the borrowed expression will literally be rendered into the TL. For example, rendering the noun phrase "*part-time job*" into "دوام بوقت جزئي" is an example of lexical calques while borrowing the English passive structure "*by-structure*" into "من قبل" is an example of structural calques.

3. Literal Translation:

This type of translation transfers expressions, phrases, and clauses that existed in the ST into the TL literally without any change in terms of the TL grammars. What follows elaborate this strategy:

ST:

فـي والمازوت الـ سولار محل الـط بـيعي الـ غاز بـ إحلال الـطاقة لـ تر شـديد خطة تـ ذ فـيذ والـطاقة الـ كهربـاء قـطاع خ براء بـ دأ
لـ لـ تـصدير رارا سولـ توف يرال تولـ يدمحطاتـ تـ شـغ لـيل

TT:

Experts of the electricity and energy have begun carrying out a project for the proper use of energy by substituting natural gas for solar and fuel oil in the operation of power stations to save the solar for export.

4. Transposition:

That means using a one-word class instead of another without changing the meaning of the message. The following example illustrates this strategy:

ST:

Shake well before use. Hold can upright and spray from face and body. Note that the spray is released upwards from the top of the cap.

TT:

أن ملاحظة يـ جب .والـ جـسم الـوجه عن بعيداً الـ بخاخ بـ رش وقـم عمودي بـ شـكل الـ عـ بوة امـسك .الا سـ تـعمال قـ بل جيداً الـ عـ بوة رج
.الـ غطاء قـمة من الأعـ لى ذ حو يـ نطلق الـ بخاخ

As seen from the example above, the translator opts to render the English adverb *"upright"* into the Arabic prepositional phrase "بشكل عمودي" successfully, whereas he fails in rendering the English verb *"spray"* because of using "قم برش" instead of "رش".

5. Modulation:

This subcategory means conveying the ST message in a different form by changing a point of view. For example, an oscillation between passive and active forms.

6. Equivalence:

It is used to translate any idiom, proverb, or nominal or adjectival phrase by presenting different stylistic and structural methods. For example, rendering the Arabic idiom *"على أحر من الجمر"* into *"to be on tenterhooks"*.

7. Adaptation:

It occurs when there is a cultural difference between the source and target languages. In this case, a special kind of equivalence is required, i.e. situational equivalence. For example, changing the proper English noun in a simile "he is rich as *Croesus*" into "قارون" in the Arabic expression "يملك مال قارون".

However, Baker (1992) introduces a taxonomy of eight translation strategies used by professional translators to cope with non-equivalence issues of translation. These strategies are:

1. Translation by a more General Word

This strategy is used with many types of non-equivalence, especially in the field of propositional meaning. Since meaning is not language-dependent in the semantic field, Baker believes that this strategy works appropriately in most languages, if not in all.

2. Translation by a more Neutral/less Expressive Word

This strategy is concerned with the semantic field as well.

3. Translation by Cultural Substitution

This strategy replaces a culture-specific item or expression with another item in the target language. However, a target expression does not have the same propositional meaning of a source expression, but it creates the same effect on the target reader. Such a strategy results in making the translated text more natural, more understandable, and more familiar to the target reader. According to Baker, applying this strategy depends on two factors:

a. The degree of freedom the translator enjoys.

b. The skopos of the translation (i.e. the purpose of the translation).

4. Translation Using a Loan Word or Loan Word plus Explanation

This strategy looks helpful with culture-specific items, modern concepts, and buzz words, especially when the word is repeated many times in the text. In this case, the translator will mention the loan word with an explanation to clarify its meaning to target readers at the first time; then, the word will be used as it is next time.

5. **Translation by Paraphrase Using a Related Word**

This strategy is used in two cases; if a concept in the SL is lexicalized in the TL by a different form or if a concept with a certain form is repeated many times in the ST, that would not be natural and readable in the TT.

6. **Translation by Paraphrase Using Unrelated Words**

This strategy can be used when a particular concept in the ST is not lexicalized in the TL. In this case, translators may rely on modifying a superordinate or unpacking the meaning embedded in the source item.

7. **Translation by Omission**

Omitting an item or expression could sometimes be necessary to avoid lengthy explanations when that item or expression does not add much to the text's overall meaning.

8. **Translation by Illustration**

This strategy can be used when the item in the target language fails to convey all the features and aspects of the word in the source language. In order to avoid over-explanation and to translate the item or expression concisely, this strategy can be used successfully.

Baker's (1992) classification of translation strategies seems to have the most applicable set of strategies that professional translators can test to check its applicability.

E. Empirical Studies

Sharkas (2009) investigates the translation's quality of popular science articles and sheds light on the techniques and strategies utilized by translators to overcome these problems to produce an adequate translation. The research data in her study is dawn from five issues of *Majallat al-'Uluum*, the Arabic version of the Scientific American, and their translations. The data are analyzed based on Hervey and Higgins' (1992) translation model and assessed on five textual levels: genre, cultural, semantic, formal, and varietal. Sharkas (2009) concludes that there are some translation problems on different levels. For example, idioms and names of people, institutions, and projects are the main issues on the cultural level. The translation of scientific terms is the main problem on the semantic level, and compound structures and nominalizations are the main problems on the formal level. Finally, the register is the central problem in this genre on the varietal level.

Similarly, Sa'eed and Malalla (2014) exhibit the problems encountered by translators in translating biochemical texts from English into Arabic. The sample of this study consists of one SL text containing 28 sentences. These sentences are simple, compound, or complex, rendered by translators on several occasions. The data are analyzed based on several levels: syntactic, semantic, and stylistic. The study reveals that employing loan translation (transference) in many cases is irreplaceable because of a wide gap between the SL and TL. In addition, it is possible to reach the stage of complete loyalty to the original text, but this is at the expense of the stylistic level. Finally, translating biochemical texts from one language into another encounters several problems at different levels of analysis; syntactic, stylistic, or semantic levels. The most serious one is the semantic one since the whole meaning could be distorted.

Argeg (2015) examines the problems of translating medical terms from English into Arabic and how competent postgraduate students and Arabic translators who work in the medical field have tackled these problems. In her study, a quantitative research design, as well as a quantitative, is adopted in collecting data. The sample of this study consists of forty-five English medical terms extracted from different medical reports, namely National Health Service (NHS) leaflets and flyers, and World Health Organization (WHO) reports for 2007 and 2008. The study finds that translating medical terms from English into Arabic poses many challenges to both students and professional translators. Furthermore, it highlights the importance of training translators who work in the medical field. Also, the study concluded that the main reasons that could lie behind these problems are the lack of students' experience in medical translation, literal translation, inconsistency, and the lack of using up-to-date English-Arabic medical dictionaries.

However, Awang and Salman (2017) study the main translation and Arabicization strategies utilized by the academy in its terminology work. The sample of this study consists of ten English scientific and technical terms with their translational and Arabicized equivalents collected from the Arabic Language Academy of Cairo (Cairo ALA). A descriptive and comparative analysis is adopted in this study. The study reveals that different translation methods, such as borrowing (loan word), loan translation (calque), and literal translation (word-for-word) are employed to compensate the loss resulting in the process of translation, and Arabicization ones, such as outright phonetic borrowing, loan translation, derivation, and composition, are also utilized.

III. METHODOLOGY

This section explains the methodology followed in conducting the current study. It starts with a description of the data selected and is followed by a description of data analysis.

A. Data Source and Sample of the Study

The sample of this study consists of one English text entitled "*Facts on Honey and Cinnamon*" retrieved from this website *https://www.gadourychiropractic.com/blog/72056-facts-on-honey-and-cinnamon*, and its translation is done by 20 undergraduate students, at the third and fourth level, studied at Jadara University in Jordan. Those students were taught by the researcher in 2020. The text consists of *938 words* composing different types of sentences as simple, compound, and complex.

B. Data Analysis and Procedures

This study relies on syntactic issues and lexical items to analyze data. These issues involve word order (markedness), agreement, tense and aspect, passive structure, word diction, preciseness, and terminological consistency.

C. Procedures

In this study, the following procedures are adopted:
Step 1: Selecting an English scientific text and ensuring that the text is not translated on the internet.
Step 2: Sending the ST to the students to translate.
Step 3: Comparing the ST with the different translation versions.
Step 4: Determining the translated extracts with lexical or syntactic errors in the translation.
Step 5: Classifying these extracts based on the type of the error, whether lexical, such as word diction, preciseness, and terminological consistency, syntactic, such as word order (markedness), agreement, tense, and aspect and passive structure or translation strategies, such as and substitution.

IV. Results and Discussion

This study aims to analyze and assess the translation of a scientific text entitled *Facts on Honey and Cinnamon* from English (as a SL) into Arabic (as a TL), and investigate the main reasons behind these problems. According to Nord (2018), determining the type of the text affects the type of lexis, vocabulary, syntactic structure, even cultural items, etc., used inside that text. Thus, the selected text falls under the informative text type.

Analysis (Assessing the Translation Product)

The translator may encounter several problems during the translation process due to the differences among languages in terms of sound, lexis, grammar, and style. Thus, the analysis of the selected text is based on two main issues: linguistic issues (lexical and syntactic problems) and issues regarding translation strategies (addition, deletion, and substitution) followed when needed to emphasize a theoretical thought and/or idea by the most relevant research.

A. Linguistic Issues

In this section, the translation of the selected text is analyzed in terms of lexical items and syntactic issues.

1. Syntactic Issues

Differences among languages may cause various syntactic problems. The number of these problems depends on the relations among languages, i.e., whether they belong to the same language family. As for Arabic and English, the probability of encountering many syntactic problems is very high because each language belongs to a different family. Based on the analysis, the most syntactic problems encountered by the translator of the selected translated text are the following:

a. Word Order (Markedness)

According to Hawkins (1980), English is considered an analytic language, meaning the word order and the function words are the main determinants of the syntactic relationships. In contrast, Arabic is considered a synthetic one which means the inflectional forms are the determinants of the syntactical relationships among the components of the sentence.

In English, SVO is the basic unmarked word order, and this word order determines the syntactic function of sentence elements. However, thematic reordering in English is allowed. It can be achieved by thematic fronting and thematic postponement. On the other hand, the basic word order in Arabic is VSO, and the variation in the ordering of sentence elements is dependent on syntactic, stylistic, rhetorical, and contextual factors (Khalil, 2010). Thus, according to Saraireh (2014, p.196), "any other grammatically permissible word orders in both languages are marked", and changing any syntactic positions of sentence elements within a functional structure of any clause will overtly indicate different interpretations (Gunther, 2012).

Regarding the translation process, the translator should not change the word order from unmarked in the ST into marked in the TT or vice versa if it is not justifiable. The following tables include various examples that show how unmarked sentences translated into marked and vice versa.

TABLE 1
EXAMPLES OF UNMARKED SENTENCES TRANSLATED INTO MARKED

ST	TT	Suggestion
<u>Honey and Cinnamon are used</u> to solve serious health problems.	العسل والقرفة يُستخدمان لحل مشاكلات صحية خطيرة	يُستخدم العسل والقرفة لحل مشكلات صحية خطيرة
<u>Scientists of today also accept</u> honey as a 'Ram Ban' (very effective) medicine for all kinds of diseases.	والعلماء المعاصرون يقرّون أنّ العسل دواء ذو فاعلية عالية ضدّ الأمراض	ويقر العلماء المعاصرون أنّ العسل دواء ذو فاعلية عالية ضدّ الأمراض
<u>Regular use of the above process relieves</u> loss of breath and strengthens the heartbeat.	الاستخدام المنتظم للنظام المذكور أعلاه يخفف من ألآم ضيق التنفس ويقوّي نبض القلب.	يخفف الاستخدام المنتظم للنظام المذكور أعلاه من ألآم ضيق التنفس ويقوّي نبض القلب
<u>Arthritis patients may take</u> daily, morning, and night, One cup of hot water with two spoons of honey and one small teaspoon of cinnamon powder.	مرضى الروماتيزم يمكن أن يتناولو كوب من الماء الدافئ ممزوجاً مع ملعقتين من العسل وملعقة صغيرة من مسحوق القرفة يوميا صباحاً ومساءً.	يمكن أن يتناول مرضى الروماتيزم يومياً كوب من الماء الساخن ممزوجاً مع معلقتين من العسل وملعقة صغيرة من مسحوق القرفة صباحاً ومساءً.

As Table 1 shows, the English sentences have unmarked word order (SVO), which means that the original writer would not focus on any element of the sentence since marked order is utilized for encoding pragmatic information such as focus and saliency and marking information structure (Khalil, 2010). However, in the target text, the translator changed the word order of the sentences from unmarked (VSO) into marked (SVO), but reordering sentence elements in Arabic, whether obligatory or optional, are based on certain conditions which are not applied here. Even when translating unmarked into marked might be understood by the Arab readers, it is not acceptable in standard Arabic.

On the other hand, analysis of the text along with the translation shows that some English sentences which have marked word order were translated into unmarked Arabic ones. Table 2 shows specific examples of sentences translated from marked into unmarked.

TABLE 2
EXAMPLES OF MARKED SENTENCES TRANSLATED INTO UNMARKED

ST	TT
<u>Honey is produced</u> in most of the countries of the world	ويُنتَج العسل في معظم دول العالم
<u>Honey can be used</u> without any side Effects for any kind of diseases.	ويمكن أن يُستخدم العسل بدون أي آثار جانبية لأي مرض من الأمراض.
Recent research in Japan and Australia has revealed <u>that advanced cancer of the stomach and bones have been cured successfully</u>	وقد أظهرت أبحاث أجريت مؤخراً في اليابان وأستراليا بأنه قد تمت معالجة سرطان المعدة والعظام المتقدم بنجاح

As Table 2 shows, marked English sentences (passive sentences) are rendered into unmarked Arabic verbal sentences because fronting and postposing in Arabic have syntactic and rhetorical motivations which are not applied here (Khalil, 2010). i.e., the syntactic system of the Arabic language does not allow maintaining markedness. Thus, the translator was forced to shift markedness.

b. Agreement

According to Khalil (2010), the English language has two types of concord, grammatical and notional. Subject-verb agreement and pronoun reference agreement fall under the grammatical concord, whereas semantic plurality falls under the notional one.

In English, reflexive, relative, and demonstrative pronouns should agree with their antecedents in gender and number, whereas in Arabic, pronouns should agree with their antecedents in number, gender, and case. Thus, a good translator should take these distinctions into consideration (Aziz, 1989).

Analysis of the text along with the translation shows that the translator paid attention to this point except for two instances, as shown in Table 3.

TABLE 3
EXAMPLES OF LACK OF PRONOUN REFERENCE AGREEMENT

ST	TT	Suggestion
Make <u>a paste</u> of honey and cinnamon powder, apply <u>it</u> on bread, instead of jelly and jam, and eat it regularly for breakfast.	اصنع عجينة من العسل ومسحوق القرفة، وادهنه على قطعة خبز بدلاً من المربَّى أو الجلي وتناولها بانتظام على الفطور.	اصنع عجينة من العسل ومسحوق القرفة وادهنها على قطعة خبز بدلاً من المربى أو الجلي وتناولها بانتظام على الفطور
Take two tablespoons of cinnamon powder and one teaspoon of honey in a glass of lukewarm water and drink <u>it</u>. <u>It</u> destroys the viruses in the bladder.	تناول معلقتي طعام من مسحوق القرفة وملعقة صغيرة من العسل مع كوب ماء دافئ واشربها. فهي تقتل الفيروسات في المثانة.	تناول معلقتي طعام من مسحوق القرفة وملعقة صغيرة من العسل مع كوب ماء دافئ واشربه. فهو يقتل الفيروسات في المثانة.

As Table 3 shows, the pronoun *it* in the first example refers to *a paste* as an antecedent, whereas in the TT there is no gender agreement between the bound pronominal clitic *hu* and its antecedent عجينة where عجينة is feminine in gender. So, the translator should use the pronoun *haa* to agree with its antecedent. However, in the second example, the pronoun *it* refers to *a glass of lukewarm water*. In Arabic, *glass* كوب is masculine in gender, and thus the translator should use the bound pronominal clitic *hu* instead of *haa* in the first instance and the independent nominal pronoun *huwa* هو instead of

hiya هي in the second one.

c. Tense and Aspect

Regarding tense, English, as well as Arabic, has two simple tenses: past and present. On the other hand, the aspect of perfectness that commonly appears in English is missing in Arabic. Therefore, translators should be careful that the English perfective is realized by *have + ed participle*, whereas the Arabic perfective is realized by *qad + perfect*.

Based on the researcher's analysis, it is observed that the translator encountered a problem in rendering the present perfect tense in different parts of the selected text. The following examples illustrate this point:

TABLE 4
EXAMPLES OF ERRORS IN RENDERING TENSE AND ASPECT

ST	TT	Suggestion
Weekly World News <u>has given</u> the following list of diseases that can be cured by honey and cinnamon	أَصدرتُ ويكلي وورلد نيوز قائمة الأمراض التالية التي يمكن معالجتها بالعسل والقرفة	وقد أَصدرتُ ويكلي وورلد نيوز قائمة الأمراض التالية التي يمكن معالجتها بالعسل والقرفة
In America and Canada, various nursing homes <u>have treated</u> patients successfully and <u>have found</u> that…	عالجتُ العديد دور رعاية المسنين المرضى بنجاح باستعمال هذا النظام الغذائي من العسل والقرفة، ووجدتُ أنَّ …	وقد عالجتُ دور رعاية المسنين باستعمال هذا النظام الغذائي من العسل والقرفة المرضى بنجاح وقد وجدتُ أنَّ…
A scientist in Spain <u>has proved</u> that honey contains a natural ingredient	أثبتُ باحث في إسبانيا أنَّ العسل على يحتوي مكون طبيعي	وقد أثبتَ باحث في إسبانيا أنَّ العسل يحتوي على مكون طبيعي

As Table 4 shows, the translator rendered the present perfect tense *has given, have treated, have found and has proved* by using the past tense أصدر، عالج، وجد، أثبت which are equivalents to past tense in Arabic without adding the particle *qad* قد. Therefore, he fails to convey the identical meaning of the ST in terms of aspect.

d. Passive Structures

Arabic prefers active structures rather than passive whenever the agent of the sentence is known. However, the translator of this text tended to render the agentive English passive into agentive Arabic passive by borrowing the English syntactic structure. The following examples illustrate this point:

TABLE 5
EXAMPLES OF ENGLISH PASSIVE STRUCTURES TRANSLATED LITERALLY

ST	TT	Suggestion
If it <u>is taken regularly by arthritis patients</u>, they can be cured.	<u>فإذا أخذ بانتظام من قبل مرضى</u> الروماتيزم، سيساعد ذلك في شفائهم.	<u>فإذا تناوله مرضى الروماتيزم بانتظام</u>، سيساعد ذلك في شفائهم.
as it <u>was researched by western scientists</u>:	<u>كما بُحث من قبل العلماء الغربيين.</u>	<u>كما بَحث العلماء الغربيون ذلك.</u>

As Table 5 shows, the translator resorted to borrowing the English syntactic structure to transfer the agentive passive by using the Arabic prepositional phrase
من قبل, but he should have used the active form.

2. Lexical Items

The second issue that the analysis touches upon is problems with regard to lexical items. It is observed that the translator encountered some lexical problems in terms of word diction, such as preciseness, consistency, and borrowing.

a. Word Diction

Diction refers to word choice, which is important to express human emotions and thoughts. One of the problems faced by translators is choosing the appropriate word that fits the context. In this analysis, word diction with regard to preciseness, consistency, and borrowing is discussed.

b. Preciseness

In translation, the precision in choosing appropriate words is considered one of the most critical points that technical translators should pay more attention to it because dealing with specialized texts is a very sensitive issue. Therefore, a good translator is one who picks the precise words among the groups of semantically related words in the TL which fit the context.

The analysis of the selected text showed that the translators encountered a problem in the precision of the word diction in many instances in the translated text. This is illustrated in the following table.

TABLE 6
EXAMPLES OF LACK OF PRECISION

ST	TT	Suggestion
Today's science says that even though honey is sweet, if taken in the right <u>dosage</u> as a medicine, it does not harm diabetic patients.	يقول العلم الحديث أن العسل غير مؤذٍ لمرضى السكري بالرغم من حلاوة مذاقه إذا أخذ كدواء <u>بالمقدار</u> الصحيح.	يقول العلم الحديث أنَّ العسل غير مؤذٍ لمرضى السكري بالرغم من حلاوة مذاقه إذا أخذ كدواء <u>بالجرعة</u> الصحيحة.
<u>Upset</u> Stomach	<u>تلبّك</u> المعدة	<u>اضطراب</u> المعدة
Those suffering from common or <u>severe</u> colds should take...	يجب على الأشخاص الذين يعانون من النزلات البرديّة المعتادة أو <u>الشديدة</u> تناول...	يجب على الأشخاص الذين يعانون من النزلات البرديّة المعتادة أو <u>الحادة</u> تناول...
And digests the <u>heavy</u> meals	ويساعد على هضم الوجبات <u>الثقيلة</u>	ويساعد على هضم الوجبات <u>الدسمة</u>
Weight <u>Loss</u>	<u>تخسيس</u> الوزن	<u>فقدان</u> الوزن

As Table 6 shows, the translator rendered the word *dosage* into مقدار, but according to the context, the choice مقدار is the wrong Arabic equivalent in this context since *dosage* here means جرعة *"the* amount of medicine that you should take at any one time*"* rather than مقدار which means "an amount of something". However, in the second example, the word *upset* is rendered into تلبّك which is an incorrect choice since تلبّك is used with *intestines*. Thus, the correct choice is اضطراب. In the third example, the translator tended to use the adjective الشديدة as an equivalent to *severe* to modify the noun *colds.* This choice is incorrect since حاد is collocated with نزلة برد rather than شديدة. Whereas, the translator translated the adjective *heavy* into ثقيلة in the fourth example, which is an incorrect choice. In Arabic وجبة is collocated with the adjective دسمة not ثقيلة. Finally, in the last example, the translator translated the word *loss* into تخسيس which is a wrong choice in this context. The precise choice is فقدان which means "gradual decline in amount or activity".

c. Terminological Consistency

Using synonyms for the same concept is not preferred in technical translation since inconsistency in terminologies may cause confusion for non-specialist readers. Thus, whenever a specific signifier is used by the translator for a specific concept, this concept should be used throughout the whole text.

In this parallel text, it is observed that students oscillate among two categories of inconsistencies in the TT. The first one uses the synonymous Arabic words alternately, and the second one uses the Arabic and the loan forms alternately. Good examples are provided in the Table 7.

TABLE 7
EXAMPLES OF LACK OF CONSISTENCY

ST	TT	Suggestion
Arthritis	روماتيزم (ثم لاحقاً "التهاب المفاصل")	التهاب المفاصل
Cold	نزلة برد (ثم لاحقاً "رشح")	رشح
Pimples	بثور جلدية (ثم لاحقاً "حبوب")	بثور جلدية
Influenza	إنفلونزا (ثم لاحقاً "النَّزلة الوافدة")	النَّزلة الوافدة

As can be seen in Table 7, the translator in the first three examples varied in using the synonymous Arabic words of the same concept. However, in the last example, the word *"Influenza"* is once rendered as a loan word إنفلونزا and another as النزلة الوافدة. Such inconsistencies are considered errors in translation since they may confuse non-specialist readers.

d. Borrowing

Borrowing is considered one of the common translation strategies that can be achieved by several techniques, such as loan form, loan translation, and loan blends Vinay and Darbelnet (in Venuti, 2000). Depending on the analysis, it is observed that students tended to use the loan form technique in many instances to transfer the concepts and their lexical items from the ST into the TT. The following table illustrates this point.

TABLE 8
EXAMPLES OF LOAN WORDS

ST	TT	Suggestion
Viruses	فيروسات	حمّات
Bacterial	بكتيري	جرثومي
Eczema	أكزيما	قوباء
Vitamins	فيتامينات	——
Cholesterol	كولسترول	——

As Table 8 shows, the translator resorted to using the loan form technique to render the ST terms *cholesterol, viruses, bacterial, vitamins, influenza, and eczema* into Arabic. However, when referring to Arabic *dictionaries,* we observed that there are Arabic equivalents for *viruses, bacterial, and eczema,* which means that the translator did not give priority to the native creation and immediately jumped to the loan form. However, we observed that the translator used this technique correctly regarding the terms *cholesterol and vitamins* because there are no Arabic equivalents for them.

B. Translation Strategies (Addition, Omission, and Substitution)

Global translation strategies determine the local ones. *Addition, omission, and substitution* are common techniques

that translators may resort to solve lexical or pragmatic problems. Newmark (1988) points out that translators may tend to add extra information to clarify some cultural, technical, and linguistic elements or may tend to omit unnecessary information. Thus, using such techniques should be justifiable.

Based on the analysis, translators added extra information in two instances and omitted information in one instance, as illustrated in Tables 9 & 10.

TABLE 9
EXAMPLES ON ADDITION

ST	TT	Suggestion
In America and Canada, various nursing homes have treated patients successfully.	في أمريكا وكندا، عالجت العديد من دور رعاية المسنين المرضى بنجاح باستعمال هذا النظام الغذائي من العسل والقرفة	———
Applying honey and cinnamon powder in equal parts on the affected parts, cures eczema, ringworm and all types of skin infections.	وضع عجينة من العسل ومسحوق القرفة على الأجزاء المصابة تشفي من الأكزيما والقوباء الحَلَقيَّة (مرض جلدي مُعدٍ)، وكلِّ أنواع الالتهابات الجلديَّة	———

As Table 9 shows, the translator in the first example added the phrase باستعمال هذا النظام الغذائي من العسل والقرفة in the TT to clarify that the main reason for the recovery is using honey and cinnamon. Whereas, in the second example, the translator added the noun phrase, مرض جلدي مُعدٍ, to clarify that *ringworm* is an infectious disease since القوباء الحلقية is uncommon in Arabic. Thus, these additions are justifiable since they were used to make the text clearer to the target readers.

TABLE 10
EXAMPLES OF OMISSION

ST	TT	Suggestion
Weekly World News, a Magazine in Canada, on its issue dated 17 January, 1995 has given the following list of diseases	أصدرت ويكلي وورلد نيوز في عددها الصادر في 17 يناير كانون ثاني 1995 قائمة الأمراض التالية	وقد أصدرت مجلة ويكي وورلد نيوز الكندية في عددها الصادر في 17 يناير كانون ثانٍ 1995 قائمة الأمراض التالية

As Table 10 shows, the translator deleted the nonrestrictive appositive *a Magazine in Canada,* which does not contain any essential information for identifying the noun. Thus, such deletion is justifiable since it did not change the basic meaning of the sentence.

V. CONCLUSION

This study aims to investigate the main problems encountered by translators in translating scientific texts. In addition, it aims to analyze the main reasons that could lie behind these problems. Based on the analysis above, the study reveals that the main problems encountered by the students in translating scientific texts are syntactic problems that cover word order (markedness), agreement, tense and aspect and passive structure, lexical issues, which cover word diction, preciseness, and terminological consistency, and inaccurate use of translation strategies which cover addition and omission.

It seems possible that these problems are due to the lack of translator's experience in scientific translation, and the need to train students more on this domain, and to offer more than one course for technical and scientific translation. Furthermore, students do not differentiate between stylistic variation and inconsistency regarding technical and scientific terms. Utilizing synonyms in such texts is very difficult since it creates a kind of ambiguity and inconsistency in concept-signifier correspondence. In addition, students' total dependence on a literal translation and the lack of awareness of the sensitivity of scientific texts is one of the most important reasons for these problems. These findings are in agreement with Argeg (2015) and Saraireh (2001 & 2014).

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