

Effectiveness of Translating English Technical and Scientific Terms by *Arabicization* Strategy in *Al-Oloom Ll-Oomoom* Magazine and *Syrian Researchers Network* on Reader's Understanding

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ABSTRACT

This research paper is a genuine one since all previous researches discuss *Arabicization* as a strategy of translation. However, this paper investigates this strategy as a problematic issue that translators of scientific and technical articles face. This study is based on the theoretical frames of scientific and technical terms discussed in Pinchuck (1977) and Olohan (2013). It also includes the lexical borrowing definitions of Catford (1976). *Arabicization* is also discussed based on Ahmed (2011) and Al-Asal and Smadi (2012) studies. A questionnaire has been conducted to investigate the readers' understanding of *Arabicized* terms. 160 respondents have answered the questionnaire. The data are quoted from *Al-Oloom Ll-Oomoom* magazine and *Syrian Researchers network*. The questionnaire's results are analyzed through using SPSS technique. The study concludes that different level of understanding the technical and the scientific terms depend on the frequency of use. The frequent use of the technical terms in our daily life makes these terms are more grasped than the scientific ones. This study also reveals that translating scientific terms using *Arabicization* is a problematic issue and makes these terms difficult to be understood by regular people who are not expert in the field. Footnote is a good strategy to solve this problematic issue.

INTRODUCTION

Translating science from different fields online is one of the most attractive points for Arab publishers who are interested in the digital content of Internet. *Mawdoo3* "موقع موضوع" is a Jordanian comprehensive website involves a total of 0.89% Arabic content. This increase of the online Arabic content has raised the need for translation in the scientific and technical fields. This problematic issue creates a challenge for translators to convey the same scientific and technical expressions and terms in Arabic. This paper is, therefore, investigates the Arabic translation contents (scientific and technical terms) in *Al-Oloom Ll-Oomoom* Magazine (Arabic translation of *Popular Science*) and the *Syrian researchers* network and how it may affect the different readers' understanding of these terms and expressions.

The scientific and technical magazines and networks hire specialist translators to fulfill the needed goals. This issue leads this study to investigate the use of lexical borrowing in translating the technical and scientific terms and expressions into Arabic. These scientific and the technical terms are difficult to render in Arabic language. Consequently, this research discusses Arabic readers' responses in translating

different articles from *Al-Oloom Ll-Oomoom* Magazine and the *Syrian Researchers* network.

Statement of the Problem

This research paper sheds the lights on of the challenging points that face translators of scientific and technical articles even if they are specialist. The core of this problem is that there is no equivalence for hundreds of English STs in Arabic as a TT. As a result, many scientific and technical dictionaries and glossaries have been found at the last decades or at least have been updated many times because of the new added terms. The magazine and the network that are mentioned previously aim to spread the science among ordinary and not specialized people who have only scientific and technical interests. Accordingly, another problem may occur which is the readers' inability to understand the translated articles because they are not able to understand the loanwords. Therefore, this research investigates if the readers have faced any problem in understanding the information or not. It also investigates if people understanding of such terms differs according to the field that the term belongs to.

Purpose of the Study

Many glossaries and dictionaries have been found for scientific and technical terminology. There are also many researchers have discussed different strategies for translating STTs. However, those that discussed the lexical borrowing in scientific concepts are not many. Lexical borrowing is not discussed as a problematic issue at least in Arabic.

This research paper is initiated to refer to different lexical borrowed terms from the scientific magazine *Al-Oloom Ll-Omoom* and the network *Syrian Researchers*. It mainly and pointedly analyzes the lexical borrowed words from into Arabic and the effectiveness of the using of these terms on the readers' understanding.

Research Questions

This research paper attempts to find answers for the following questions:

- 1) How does lexical borrowing affect common Arab readers' understanding of scientific and technical terms in online translated scientific magazines and networks?
- 2) How do the readers' responses toward the scientific and technical terms differ from a scientific field to another one?
- 3) How lexical borrowing for scientific terms can be considered as a problematic point in Arabic?

Significance of the Study

Many researchers have discussed lexical borrowing in different languages and different fields like science and technology. The findings and the results of this research will redound to the benefit of translators who translate scientific and technical articles especially when they translate specialized terms that have no equivalences in the target language. This study shows if there is a problematic point in translating some concepts on readers understanding.

Thus, translators, either freelancers or not, who take into their account the results of this study will hopefully be able to have a better translation. The results of this study might also be helpful for linguists since they can reach new problematic points in their fields related to the idea of lexical borrowing. They can discuss more about the borrowed terms into Arabic and how to form and structure these terms.

LITERATURE REVIEW

The researcher refers to different previous studies about translating scientific and technical terms generally and translating these terms by lexical borrowing specifically. Although the researches that discussed this topic are not wide, scholars have discussed it deeply recently and previously. Catford (1967) emphasizes that it is very difficult to establish translation equivalence between lexical items especially if the terms are technological or scientific ones. This research investigates mainly the process of *Arabicization* as a way to translate these terms. It is also discussed as problematic point for translators. It discusses the efforts that were made

by Arabic Academies to find terminology for such kind of terms.

Lexical Borrowing of Scientific and Technical Terms

Lexical system is flexible one toward any changes between languages this is the reason why we have lexical borrowing between languages. Another reason is that equivalences are not always found for all terms especially in the case of scientific and technical terms. Pinchuck (1977, p. 53) says that "one language will have no words for a concept expressed in the second language". New scientific and technical glossaries and terminologies show that most of the terms are either borrowings or new applications of words. While reading scientific texts, readers need to read and understand what the author intended to say and nothing else. It is preferable to refer to Pinchuck's indication that "a text should give readers just enough information for their purposes; no more, no less" (1977, p. 206). Catford suggests in his studies that "the central problem of translation practice is that of finding TL translation equivalents. A central task of translation theory is that of defining the nature and conditions of translation equivalence." (1967, p. 21). English is considered as the lingua franca of different fields like science and technology. Thus, dividing English terminologies according to the fields enables the readers to understand the terms easily. This is called as English for specific purposes. Olohan states that scientific and technical translators nowadays tend to be "aspired to be inquisitive and knowledgeable in a broad range of disciplines, spanning languages, science and technology" (2013, p. 2). This is because scientific and technical terms need to be clarified within the context so the readers can understand the text.

Arabicization

Lexical system is responsive to any changes between source and target languages in the case of translation. Awang and Salman (2017) indicate in their research papers that the term *Arabicization* is used when there is a lack of equivalences in Arabic. They also claim that most of new scientific and technical terms (STTs) lack natural equivalents in the target language such as Arabic. Most of Arabic linguists and researchers who investigate lexical borrowing agree on that is phonetic borrowing. However, it is expressed in Arabic as (*at-ta'rib*) (التعريب).

Al-Asal and Smadi (2012) state that *Arabicization* is used to refer to a process of translation where a term form SL is only translated stratification with the Arabic phonological and graph-logical systems. They also indicate that "when a certain English technical term is *Arabicized*, it means that it is linguistically borrowed from English and used in Arabic with some modification, e.g. 'filtration' (*faltarah*) or without modification, e.g. 'flitter' (*filtar*)" (2012, p. 22). However, Darwish has added previously that "the phonetic properties of the source language technical terms are rendered with modifications to suit Arabic pronunciation methods" (2009, pp. 113-114). *Arabicization* is the process "of translating foreign terms using Arabic forms"; this definition is conveyed

by Ahmed (2011) who believes that the process of *Arabicization* is an adopted strategy to introduce new concepts into Arabic.

Arabic Language Academies Efforts

Darwish (2009) has indicated in his research that the most important task that was done by these Arabic Language Academies since foreign languages. These academies spread among Arab countries such as in Damascus 1919, in Cairo 193, in Baghdad 1974 and in Amman 1976. He also has indicated that these Arabic language academies have used resolutions to develop the scientific and technical terminologies. One of the efforts was done by the academy in Cairo when it develops the entries of Arabic language in different fields by establishing a library with more than 40,000 titles related to different fields. In addition to the previous efforts, one of the efforts that highly affect the Arabic terminology is a project done by Arab Organization for Translation (AOT) to collect all the terms that are borrowed from other languages in one glossary. Through most of the researches, books and glossaries, not any of them has studied these lexical borrowed terms as a problem that affect readers' understanding. However, none of them conveys how readers understanding ranging according to the field from which the term comes.

Al-Oloom Ll-Oloom Online Magazine

It is an Arabic online magazine. It is publishing translated articles from different fields of science and technology. However, all the articles are translated from the original articles in the original magazine, *Popular Science*. They are translated by specialist translator in science and technology. The aim of this magazine as it is shown from its name is to spread the science among the common readers.

Syrian Researches Network

The slogan of this network is "We will write sciences with Arabic letters". This network is an initiative for encouraging reading sciences. It is established by specialist translators who are in different fields. The articles that are translated and published in this network are from different English resources. However, all of them are documented with each article. The aim of this network is to make science available for all Arab readers from different countries and different fields. The common thing between the readers is science love.

METHOD

This study is a descriptive qualitative and quantitative textual analysis analyzing the lexical borrowed terms in Arabic language. It investigates them within their different fields either technical or scientific. The terms are collected from the translated scientific magazine *Al-Oloom Ll-Oloom* and the translated articles in the *Syrian Researchers Network*. They are analyzed within the Arabic contexts to investigate whether they are understandable for the common Arab readers or not.

Instrument and Procedures

The data were collected in November of 2018. A total of 20 selected lexical borrowed scientific and technical terms are extracted from about 15 articles either from the magazine or the network through the researcher's reading of the recent published articles. The researcher collected the samples from two different resources because of the shortage of such these terms in Arabic. These samples are first categorized according to their field whether they are scientific or technical. Linguists such as Pinchuck (1977) distinguish between the two fields.

These samples then are examined in the selected contexts based on the strategy of *Arabicization* of Al-Asal and Smadi (2012) and Darwish (2009). It also investigates how this strategy may affect the target readers' understanding.

A questionnaire is designed to measure the responders' understanding. The questionnaire has different types of questions including yes-no questions and multiple choices. The questions are for investigating the responders' understanding of 20 chosen lexical borrowed terms in the quoted contexts.

160 Jordanian responders who were chosen randomly have answered the targeted questionnaire. It is not restricted by age since the magazine and the network from where the samples were selected do not limit their readers within a specific age. The survey website also does not put any age restriction that can prevent any one to respond. The responders differ in their educational level; some of them are universities graduates and some are still school students.

The questionnaire is a soft copy one that is designed on www.survs.com, a website that offers questionnaire service. It is distributed on social networks such as *Facebook*, *Twitter* and *Whats App* so the highest number of responses can be reached. SPSS software has been used by the researcher to analyze the collected data from the questionnaire and giving highly precise data in order to reach accurate findings.

DATA ANALYSIS

This chapter analyzes both the samples according to the strategy of *Arabicization* and the results of the questionnaire. The results of analyzing the data will lead to the findings of this research paper which will hopefully add new results to the theories of translation field.

A Model Sample Analysis According to the Strategy of *Arabicization*

Awang and Salman state that *Arabicization* methods include "phonetic borrowing via transliteration, which is generally referred to as *Arabicization (at-ta'rib)* by many scholars of Arabic, as well as word formation techniques such as derivation and composition" (2017, p.93). The 20 samples that are stated in the following Table 1 are selected from *Al-Oloom Ll-Oloom* and *Syrian Researchers network*. They are translated by using the *Arabicization* strategy. Al-Asal and Smadi indicates that *Arabicized* word means that "it is linguistically borrowed from English and used in Arabic with some modification or without" (2012, p.22).

Table 1: Arabicized scientific and technical terms in *Al-Oloom Ll-Omoom* Magazine and *Syrian Researchers Networks*

Scientific/technical terms	Arabicized terms (<i>at-ta'rib</i>)	Pre	Root	Post
Robot	روبوت	–	روبوت	–
Wi-Fi	الواي فاي	الـ) Definite article	واي فاي	–
Android	أندرويد	–	أندرويد	–
IOS	أي أو أس	–	أي أو أس	–
The Internet	الإنترنت	الـ) Definite article	إنترنت	–
GIF	جيف	–	جيف	–
iPhone	الآيفون	الـ) Definite article	آيفون	–
Google	غوغل	–	غوغل	–
Bluetooth	البلوتوث	الـ) Definite article	بلوتوث	–
Mega Pixel	ميغا بيكسل	–	ميغا بيكسل	–
Proxy	البروكسي	الـ) Definite article	بروكسي	–
Gravitons	الغرافيتونات	الـ) Definite article	غرافيتون	plural (ات)
Ion	الأيون	الـ) Definite article	أيون	–
Neutron	نيوترون	–	نيوترون	–
Gamma	جاما	–	جاما	–
Argon	الآرغون	الـ) Definite article	آرغون	–
Ribosomes	الريبوسومات	الـ) Definite article	ريبوسوم	plural (ات)
Mitochondria	الميتوكوندريا	الـ) Definite article	ميتوكوندريا	–
Adrenaline	الأدرينالين	الـ) Definite article	أدرينالين	–
Polymer	البلمير	الـ) Definite article	بلمير	–

A good example is the word “the photons” that is *Arabicized* as “الفوتونات” *fotonaat*. This term is scientific one and it is translated via transliteration. However, the Arabic features are obvious on the word *fotonaat* “الفوتونات”. The features here are how the word is pluralized with the post modifier (ات) *aat* as alternative of the plural (s). It is also definite by using Arabic pre-modifier (الـ) *al* as alternative for article (the).

The rest of samples are illustrated according to *Arabicization* strategy in the following Table 1.

ANALYSIS OF QUESTIONNAIRE RESULTS

Introduction of the Analysis

All the terminologies distinguish between the scientific terms and the technical terms. However, this study investigates whether the two main fields differ in their understandability according to the common readers’ assessments. The questionnaire, which is in the Appendices, consists of 6 questions. The questions are sequent in a way that lead the researcher reach the findings clearly. This section of the study analyzes the responses on the questionnaire question by question through analyzing the frequent answer, the mean, the median, the mode and the finding for each question independently.

Questions Analysis

- The first question, represented in Figure 1, is about the field on which the responders are keen. The choices for

this question are three including the scientific field, the technical field or both of them.

After collecting the 160 responders and analyzing the responses on the SPSS software, the responding frequency on this question is illustrated by the following pie chart:

- In Figure 1, It is obvious that most of the responders are interested in the technical field. They shape 43.1% of the pie. The reason of this could be because of the rapid technical and technological development around the world. However, 34.4% of the responders are interested in both fields but the other 22.5% prefers only the scientific fields. This question is a good introduction for the questionnaire since it divides the responders according to their interests. The mode of this question refers to the technical field. As SPSS shows, the mode and median for this question is technical field.
- The second question investigates which field is more understandable for the readers than another. The answers of this question include either scientific or technical terms. The frequency of answers on each choice is indicated in the following pie chart:
- Figure 2 shows that 75% of the responders indicate that the technical terms were more understandable for them when they read them within the context. However, 25% of the responders have found the scientific terms easier to understand than the technical. According to SPSS analysis, most of the 25% responders are more interested in science than technology. This has a good indication which is that interests or specialization can really affect the level of understanding. However, mode and

median for this question also refer to technical terms.

- The third question, represented in Figure 3, is a yes-no question. It investigates whether the frequency of the technical terms in our daily life is the reason behind making it more understandable or not. Responders answers are clarified in the following pie chart:
- According to SPSS analysis, 95% of the responders have answered with (Yes) as shown in Figure 3. They believe that the frequent using of technical terms in the daily life is the reason why they are more understandable for them. However, only 5% of the responders agree on that the frequency of the technical terms is not related with their understandability. Since 152 out of 160 responders agree on this reason. The research can generalize within these limited selected samples that the frequency of using of the terms raises their understandability. However, Mode and median for this question is (yes).
- The fourth question, represented in Figure 4, investigates whether the scientific terms need specialized readers in specific scientific field to understand them or not. This question is a yes-no question. the clarification of the responders answers is presented in the following pie chart:
- Figure 4 shows that 75.6% of the responders recognize that the 10 samples that they have read within the selected contexts need readers who are specialized in science fields. However, the other 24.4% responders agree on that these samples are easy to understand and do not

need specialized readers. SPSS analysis shows that the 24.4 % are interested only in science or in both science and technology and they are maybe specialized in any scientific field. This indicates that scientific terms are not clear enough since they are not used in their daily life. Mode and median here refer to the first choice (yes).

- The fifth question, represented in Figure 5, studies whether adding footnote about the scientific terms or defining the terms can help in clarifying the terms or not. This question is a yes-no question. Readers' responses on this question are illustrated within the following pie chart.
- In Figure 5, the SPSS results show that 87.5% of the responders need footnotes for the terms to make them understandable. However, 12.5% of them do not need any clarifying information. Footnote might be a good way to clarify these terms but it indicates more information than the ST. the mode for the question is (yes). The mean for this question also is the answer (yes). A clear

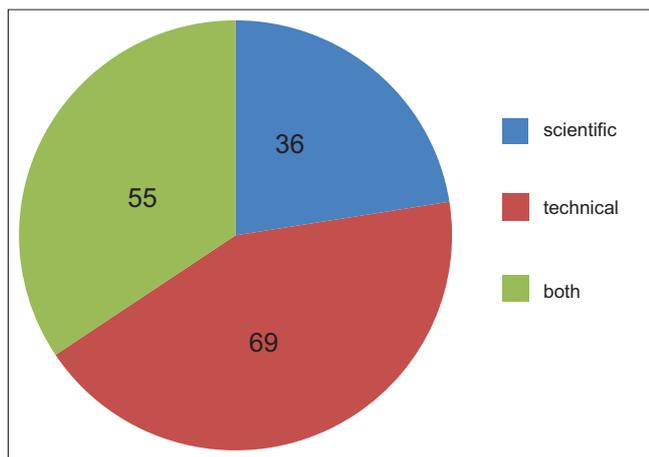


Figure 1. Q1: The field that you are interested in

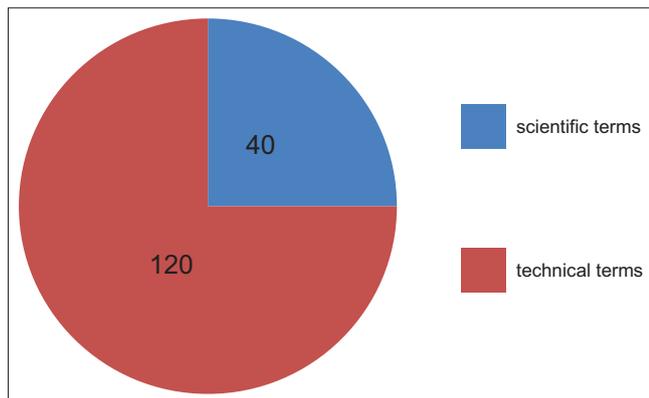


Figure 2. Q2: The terms that are more understandable for you are

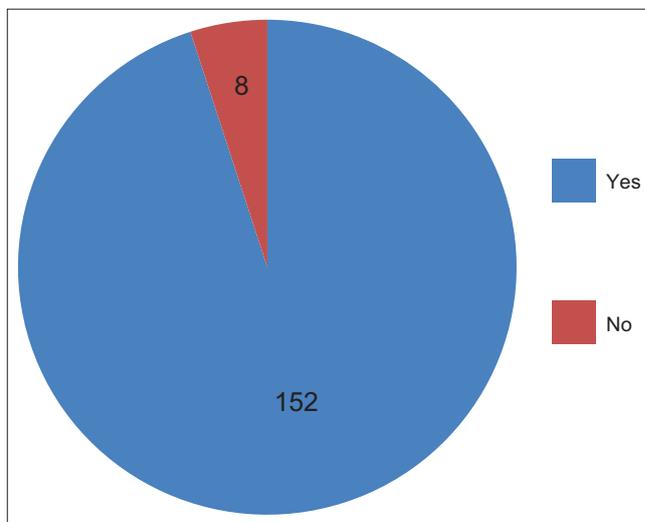


Figure 3. Q3: Does the frequency of the technical terms make them more understandable?

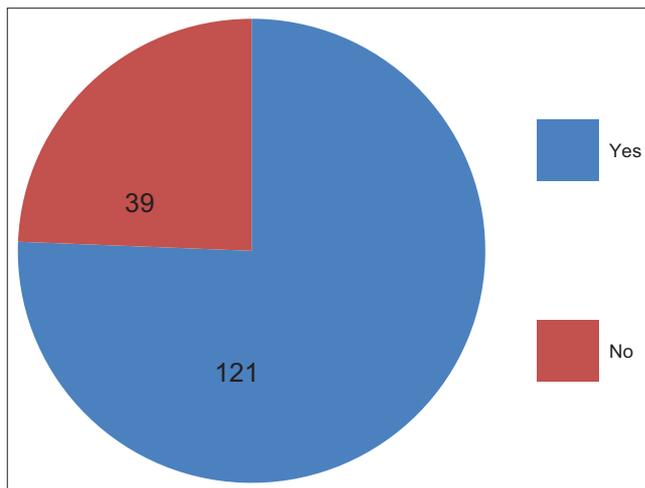


Figure 4. Q4: Do the 10 selected scientific samples need specialized readers to understand them?

indication can be shown from these results. Footnote in such cases and with such terms could be a good solution for misunderstanding.

- The sixth question, represented in Figure 6, is multiple choice one. Where the responders chose the reason that makes some terms more understandable the others. The results of responders' choices are indicated in the following pie chart (Figure 6):
- The most expected three reasons behind understanding the terms are indicated in this question (Figure 6). SPSS results reveal that 60.6% of responders believe that they understand the terms because of their previous experience. However, 25% of them think that context success in clarifying the terms. The last percentage goes for the clarity of the terms as translated ones. Only 14.4% of them think that translators have success in their translating. SPSS also shows that mode and median for this question go for the second choice.

Results of Analysis

After analyzing the responders' answers on SPSS, it is obvious that technical and scientific terms differ in their understandability. 75% of responders believe that technical terms

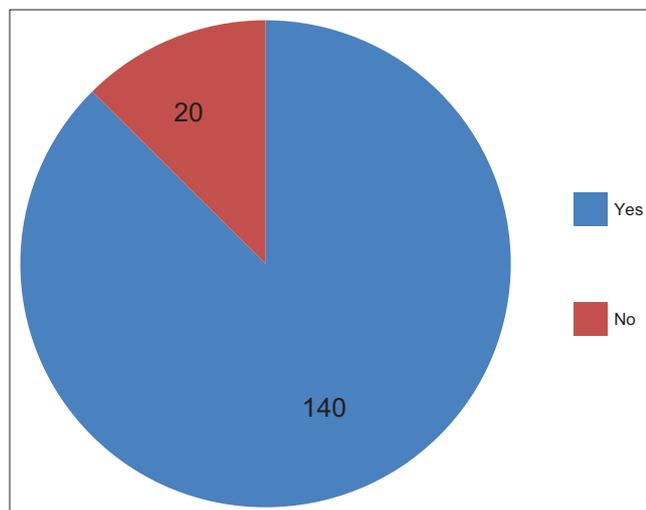


Figure 5. Q5: Do you think that adding a footnote following the terms can raise the readers' understanding of these terms?

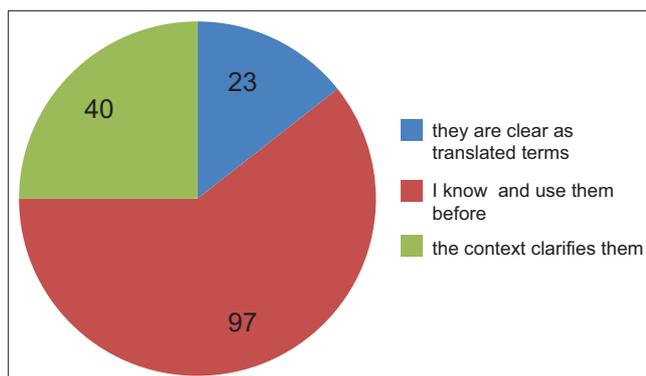


Figure 6. Q6: the reason behind your understanding of some or all terms is

are more understandable than scientific. However, 95% think that the frequent use of technical terms make them more understandable. A surprising point is that *Al-Oloom Ll-Omoom* and *Syrian Researchers* are for common readers. However, 75.6% believes that scientific terms need specialized readers to understand them. In addition, 87.5% of responders think that footnote could be a good way to clarify these terms. Most of them believe in their previous knowledge as a reason for understanding the terms.

CONCLUSION

Review of the Study

This study investigates the scientific and technical terms in *Al-Oloom Ll-Omoom* Magazine and *The Syrian Researchers Network*. 20 samples are selected from the previous source texts. This study also investigates how these terms translated by *Arabicization* strategy. Since these terms are lexical borrowing from English and have no equivalence, translators translate them via transliteration.

The study indicates the 20 samples and analyze the applied modifies on them to make them as Arabic terms. In addition, this study goes through different recent and previous studies about lexical borrowing and *Arabicization* like Catford (1967). It also refers to the translation of scientific and technical terms such as Pinchuck (1977).

This research mainly investigates the different readers' responses toward these terms. A questionnaire has been conducted to investigate the responders understanding of the terms. However, the questionnaire tends to differ between technical and scientific terms in order to reveal which ones are more understandable for common readers. 160 responders have answered six different questions. SPSS has been used to analyze the results of the questionnaire. Percentages are given precisely using SPSS. In this chapter, the findings of analysis and questionnaire results are revealed.

Research Questions Revisited

This research paper attempts to find answers for the following questions:

- 1) How does lexical borrowing affect common Arab readers' understanding of scientific and technical terms in online translated scientific magazines and networks?
- 2) How do the readers' responses toward the scientific and technical terms differ from a scientific field to another one?
- 3) How lexical borrowing for scientific terms can be considered as a problematic point in Arabic?

FINDINGS AND RESULTS

Analyzing the results of the questionnaire using SPSS concludes that there are many researchers do not distinguish between the translated scientific terms and technical terms in terms of understandability. However, the result of the questionnaire reveals that technical terms are more understandable.

The different level of understandability is because the differences in the frequency of use. Mostly, technical terms refer to things related to technology. We are highly dependent on technology and use the technical terms in our daily lives. As a result, the frequent use of technical terms makes them more understandable than scientific.

Translating scientific terms using *Arabicization* is a problematic issue. Although the terms are *Arabicized* with modifiers to make it more familiar to Arab readers, they find it difficult to understand. They also believe that these terms need specialists to understand them. However, they think that adding footnote for the terms could be a solution for this issue.

REFERENCES

- Ahmed, R. (2011). Methods of creating and introducing new terms in Arabic: Contributions from English-Arabic translation. *International Conference on Languages, Literature and Linguistics IPEDR*, 26, IACSIT Press, Singapore, 491-500.
- Al-Asal, M., & Smadi, O. (2012). Arabicization and Arabic expanding techniques used in science lectures in two Arab universities. *Asian Perspectives in the Arts and Humanities Journal*. 2 (1), 15–38.
- Al-Rajeh, M. (2016, May 13). اكتشاف أولى حقيقتيات النوى التي لا (تمتلك مصانع للطاقة (الميتوكوندريا). Retrieved October 15, 2018, from [http://www.syr-res.com/article/10200.html?fbclid=IwAR0RD1Iq0HM9dYqTR9dYM4LSrJZIYEhr7sgvoEFUc30xcTB4Q_3roVZwbPkArabic Language Academy in Cairo](http://www.syr-res.com/article/10200.html?fbclid=IwAR0RD1Iq0HM9dYqTR9dYM4LSrJZIYEhr7sgvoEFUc30xcTB4Q_3roVZwbPkArabic%20Language%20Academy%20in%20Cairo). Retrieved from: <http://www.arabicacademy.org/eg/>.
- Awang, R., & Salman, G. (2017). Translation and Arabicization Methods of English Scientific and Technical Terms into Arabic. *Arab World English Journal*, 2(Translation and Literary Studies), 92-106. <http://dx.doi.org/10.24093/awejtls/vol1no2.8>.
- Bushwick, S. (2017, June 13). مرصد ليجو يسجل ثالث عملية رصد له لثقب أسود مندمج ليغو-يسجل-ثالث-عملية-رصد-له-عن-/. Retrieved September 16, 2018, from <https://www.popsci.ae/>.
- Baggaley, K. (2017, June 21). The world's art is under attack—by microbes. Retrieved September 15, 2018, from <https://www.popsci.com/art-attack-microbe>
- Baggaley, K. (2017, June 26). الفن العالمي يتعرض للهجوم من قبل الميكروبات. Retrieved September 18, 2018, from https://www.popsci.ae/?-submit_feedback=ok&id=3168
- Batal, R. (n.d.). كيف يمكن لروبوت أن يمشي في سوق مزدحم بالناس؟ Retrieved December 8, 2018, from <https://www.syr-res.com/article/14358.html>
- Bushwick, S. (2017, October 16). Gravitational waves just showed us something even cooler than black holes. Retrieved October 25, 2018, from <https://www.popsci.com/gravitational-waves-neutron-stars>
- Bushwick, S. (2017, October 18). الأمواج الثقالية تبين لنا شيئاً أروع من الثقوب السوداء. Retrieved November 25, 2018, from <https://www.popsci.ae/>
- Bushwick, S. (2017, June 1). LIGO spots its third black hole merger. Retrieved October 19, 2018, from <https://www.popsci.com/ligo-spots-its-third-black-hole-merger>
- Catford, J. (1967). Translation and language teaching. In Conseil de l'Europe. Conseil de coopération culturelle (Eds.), *Linguistic theories and their application*. AIDE-LA: London.
- Chu, J. (2017, August 30). New robot rolls with the rules of pedestrian conduct. Retrieved December 8, 2018, from <https://www.sciencedaily.com/releases/2017/08/170830103446.htm>
- Crawford, D. (2018, June 14). The Ultimate Proxy Server Guide & How It Differs From a VPN. Retrieved November 9, 2018, from <https://www.bestvpn.com/guides/proxy-server/>
- Darwish, A. (2009). *Terminology and translation: A phonological-semantic approach to Arabic terminology*. Australia: Write scope Publishers.
- Fecht, S. (2017, April 21). This is how a star-enveloping solar power plant might work. Retrieved November 25, 2018, from <https://www.popsci.com/star-enveloping-solar-power-plant>
- Fecht, S. (2017, October 17). هكذا يعمل نظام فضائي لاستهلاك الطاقة الشمسية بالكامل. Retrieved November 22, 2018, from <https://www.popsci.ae/>
- Ferjer, B. (2017, November 24). يمكنك استخدام ورق الألمنيوم لتقوية إشارة الواي فاي. Retrieved September 20, 2018, from <https://www.popsci.ae/>
- Johns, M. (2017, June 9). The best ways to make your own GIFs. Retrieved October 30, 2018, from <https://www.popsci.com/gifs-made-easy>
- Johns, M. (2017, June 19). أفضل الطرق لصنع صورك الخاصة بصيغة جيف. Retrieved September 25, 2018, from <https://www.popsci.ae/>
- Lee, J. (2013, April 16). Google Glass specs revealed – 16GB storage, 5MP camera, 720p video recording. Retrieved October 18, 2018, from <http://www.wirefresh.com/google-glass-specs-revealed-16gb-storage-5mp-camera-720p-video-recording/>
- Leslie, M. (2016, May 12). First eukaryotes found without a normal cellular power supply. Retrieved November 25, 2018, from <https://www.sciencemag.org/news/2016/05/first-eukaryotes-found-without-normal-cellular-power-supply>
- Mock, J. (2018, October 3). This year's Nobel Prize in chemistry 'rewards a revolution based on evolution'. Retrieved November 30, 2018, from <https://www.popsci.com/nobel-prize-chemistry-2018>
- M. (n.d.). النسبة السنوية لحجم المحتوى العربي من حجم المحتوى العالمي. Retrieved November 25, 2018, from <https://mawdoo3.com/arcontent>
- Mock, J. (2018, October 9). جائزة نوبل للكيمياء هذه السنة تعيد التطور الى المشاهد من جديد. Retrieved November 30, 2018, from <https://www.popsci.ae/>
- Nield, D. (2017, August 13). كيف تقوم بمشاركة ملفات ضخمة عبر الانترنت. Retrieved December 1, 2018, from <https://www.popsci.ae/>
- Nield, D. (2017, August 8). How to share huge files online.

- Retrieved October 17, 2018, from <https://www.popsci.com/share-huge-files-online>
- Nield, D. (2018, March 22). Make your Android and IOS devices work together. Retrieved October 10, 2018, from <https://www.popsci.com/make-android-ios-work-together>
- Nield, D. (2018, April 8). اجعل اجهزة أندرويد و آي أو إس تعمل معاً. Retrieved November 15, 2018, from <https://www.popsci.ae/اجعل-أجهزة-أندرويد-وآي-أو-إس-تعمل-معاً/>
- Olohan, M. 2013. "Scientific and Technical Translation." In *The Routledge Handbook of Translation Studies*, ed. by C. Millán and F. Bartrina, 425–437. London/New York: Routledge.
- Pinchuck, I. (1977). *Scientific and technical translation*. London: Andre Deutsch.
- Talebinejad, M. R., Dastjerdi, H. V., & Mahmoodi, R. (2012). Barriers to technical terms in translation: Borrowings or neologisms. *Terminology*, 18 (2), 167-187.
- Patel, N. (2018, May 30). Scientists just discovered 125 million-year-old dinosaur dandruff. Retrieved from <https://www.popsci.com/dinosaur-dandruff>
- Patel, N. (2018, June 18). العلماء يكتشفون «قشرة شعر» لديناصور. بعمر 125 مليون سنة. Retrieved November 30, 2018, from <https://www.popsci.ae/العلماء-يكتشفون-قشرة-شعر-لديناصور-بعمر-125-مليون-سنة/>
- Ramadan, S. (n.d.). نظارة غوغل عين على المستقبل. Retrieved September 20, 2018, from <https://www.syr-res.com/article/4113.html>
- Sukariah, S. (n.d.). تغيير هويتك بتغيير البروكسي. Retrieved November 16, 2018, from <https://www.syr-res.com/article/6463.html>
- University, C. (2018, April 26). 'Infinitely' recyclable polymer shows practical properties of plastics. Retrieved November 30, 2018, from <https://phys.org/news/2018-04-infinitely-recyclable-polymer-properties-plastics.html>
- Verger, R. (2017, November 10). You can use aluminum foil to strengthen your Wi-Fi signal. Retrieved September 20, 2018, from <https://www.popsci.com/aluminum-strengthen-wi-fi-signal>
- Verger, R. (2018, September 13). 6 reasons to upgrade your iPhone right now. Retrieved November 20, 2018, from <https://www.popsci.com/iphone-XS-upgrade>
- Verger, R. (2018, September 26). متى يجب أن تحدث الأيفون الخاص بك؟. Retrieved December 4, 2018, from <https://www.popsci.ae/iphone-xs-upgrade>
- Verger, P. (2017, November 24). يمكنك استخدام ورق الألمنيوم لتقوية إشارة الواي فاي. Retrieved November 25, 2018, from https://www.popsci.ae/يمكنك-استخدام-ورق-الألومنيوم-لتقوية-إشارة-الواي-فاي-/?submit_feedback=ok&id=7028

APPENDICES

Arabic Questionnaire

تحتوي هذه الإستبانة على مجموعة من المصطلحات العلمية و التقنية الدخيلة على اللغة العربية. حيث تدرس هذه الإستبانة مدى فهم القارئ العربي للمصطلحات العلمية و التقنية المقتبسة من شبكة الباحثين السوريين و مجلة العلوم للعموم.

تستهدف هذه الدراسة القراء المهتمين بقراءة المجلات المختصة بالعلوم و التكنولوجيا و ليس بالضرورة المختصين في أي مجال علمي معين أماك 20 مصطلحاً علمياً و تقنياً دخيلاً على اللغة العربية مقتبسة من مجلة العلوم للعموم و شبكة الباحثون السوريين. بعد قراءتك لهذه المصطلحات ضمن السياق المطروح أجب عن الأسئلة التالية:

- استطاع المهندسون في معهد ماساتشوستس تصميم رويوتٍ مستقل مع نظام ملاحه و اعية اجتماعيا
- يمكنك استخدام ورق الالمنيوم لتقوية إشارة الواي فاي
- اجعل اجهزة أندرويد و آي أو إس تعمل معاً
- كيف تقوم بمشاركة ملفات ضخمة عبر الانترنت
- افضل الطرق لصنع صورك الخاصة بصيغة جيف
- ستة أسباب لتحديث الأيفون الخاص بك الآن
- نظارة غوغل عين على المستقبل
- نظارة غوغل متوافقة مع أي هاتف يدعم البلوتوث
- دقة الصور للكاميرا 5 ميغا بيكسل
- إن مخدّم البروكسي هو حاسوب يعمل كوسيط بين جهاز الحاسوب الخاص بك و بين شبكة الانترنت
- و بالنظر إلى معدل اندماج الثقوب السوداء تمكن مرصد ليجو من التقاط ثقب اسود مندمج جديد كل اسبوع. حتى صار بإمكان هذه الاحداث ان تكشف لنا عن اسرار الغرافيتونات. و هي الجسيمات النظرية التي يمكنها ان تكون مصدر الجاذبية
- عندما تضرب الفوتونات أنظمة التجميع الشمسية، تقوم شيئاً فشيئاً بتحريكها من مكانها
- أثناء عمل المجموعة باستخدامالمجاهر العادية و الإلكترونية، إستمر الباحثون في الوصول الى النقط البيضاء الغربية الموجودة في جميع انحاء الريش.
- و عند إجراء مزيد من التحري باستخدام مجهر الحزمة الأيونية حدد الفريق البقع على أنها خلايا قرنية
- تصادم نجوم نيوترونية أثناء عملية الإندماج و إطلاق المادة و أشعة جاما
- عندما تتعرض الآثار الى استعمار من قبل المايكروبات، يجب تجفيفها و تنظيفها قبل أن يقوم الحماة بالعمل على استعادتها كما كانت. حيث يمكن وضع الآثار ضمن غرفة مليئة بالغازات مثل الأرغون
- ستحصل أدا يونات على جائزة الكيمياء لعملها على الريبوسومات
- بوليمير ذو خواص بلاستيكية قابل لإعادة التدوير دائماً
- لا يمكنك أن تعيش بدون وجود الميتوكوندريا

السؤال الأول: هل أنت مهتم بالجانب		(أ) العلمي	(ب) التقني	(ج) كلاهما
السؤال الثاني: بعد قراءتك للمصطلحات فإن المصطلحات التي كانت أسهل و أوضح للفهم هي		(أ) المصطلحات العلمية	(ب) المصطلحات التقنية و التكنولوجيا	
السؤال الثالث: ذا كانت إجابتك " المصطلحات التقنية و التكنولوجيا" أجب عن هذا السؤال هل ترى أن كثرة تداول هذه المصطلحات التقنية و التكنولوجيا في حياتنا اليومية جعلت منها مفهومة لكل القراء حتى لو كانت دخيلة من لغة أخرى؟		(أ) نعم	(ب) لا	
السؤال الرابع: إذا كانت إجابتك على السؤال الثاني "المصطلحات العلمية"، هل ترى أن فهم المصطلحات العمية المتخصصة يحتاج الى شخص متخصص في المجال العلمي الذي ينتمي إليه كل مصطلح؟		(أ) نعم	(ب) لا	
السؤال الخامس: في حال عدم فهمك لأي من المصطلحات العلمية أو التقنية، هل ترى أن إضافة معلومة هامشية لتعريف المصطلح أمر ضروري لتحقيق فهم المصطلح في حال عجز السياق عن التوضيح؟		(أ) نعم	(ب) لا	
السؤال السادس: يعود سبب فهمك لبعض أو كل المصطلحات المقتبسة على اختلافها علمية أو تقنية إلى:		(أ) وضوحها كمصطلحات مترجمة	(ب) سياقها في النص جعلها واضحة	(ج) خبرتي السابقة و مرور الكلمات علي مسبقاً

English Questionnaire (the Translation of Questionnaire)

This questionnaire consists of 20 scientific and technical terms in different 20 contexts translated by specialized translator in science. It investigates the readers' understandability of such these terms. This questionnaire is not only for specialized readers.

The following are 20 scientific and technical terms quoted for the Popular Science magazine and the Syrian Researchers network. Read them and then answer the following questions:

- New engineers at MIT have designed an autonomous robot that can keep pace with foot traffic.
- You can use aluminum foil to strengthen your Wi-Fi signal
- Make Android and IOS work together.
- How to share huge files on the Internet?
- The best ways to make your own GIFs
- 6 reasons to upgrade your iPhone right now
- Google glass, Eye on future
- The glass is consonant with any phone supports Bluetooth.
- The camera's resolution is 5 mega pixels
- A proxy server sits between your computer and a wider network.
- These events could even uncover the secrets of gravitons, the theoretical particles that could be the source of gravity.
- As photons hit the solar collectors, they nudge them background little by little.
- Upon further investigation using ion beam microscope, the team identified speak as coenocytes.
- Collecting Neutron stars during merging, ejecting and shooting out gamma rays.
- Artifacts can also be placed in a chamber filled with gases like argon.
- Ada E. Yonath will receive the prize in chemistry for her work on Ribosomes.
- Infinitely recyclable polymer shows practical properties of plastics.
- You can't survive without mitochondria.

Q1) Are interested in:	a. Science	b. Technology	c. Both
Q2) The terms that are more understandable for you are:	a. Scientific terms		b. Technical terms
Q3) Does the frequency of the technical terms make them more understandable?	a. Yes		b. No
Q4) Do the 10 selected scientific samples need specialized readers to understand them?	a. Yes		b. No
Q5) Do you think that adding a footnote following the terms can raise the readers' understanding of these terms?	a. Yes		b. No
Q6) The reason behind your understanding of some or all terms is:	a. They are clear as translated terms		
	b. The contexts clarifies these terms		
	c. I know these terms before		