Post-Editing as a Creative Tool in Improving the Quality of the Product of Translation Students

Researcher Mays Fareeq Shakir
Professor Dr. Kadhim Khalaf Al-Ali
Department of Translation, College of Arts, University of Basrah

Abstract:

Post-edit is defined as the way of correcting machine translation (MT) output. The massive use of (MT) systems in the modern world, specifically neural machine translation (NMT) makes post-edit as one of the main skills translators should have to involve in global markets. The present study investigates the improvement of the quality of the product of translation students to post-edited Google MT output. It focuses on the amounts of post-edit in correlation with types of errors produced by Google MT. Moreover, the study investigates the quality of the final products 44 translation students at University of Basrah in their final year are involved in the study. They receive pre-translated text by Google translate and are asked to post-edit. The results have shown that (21.2%) terminology errors and (48.8%) grammatical errors have not been corrected. A mixed-method approach is used to collect qualitative and quantitative data analyzed within the Dynamic Quality Framework (DQF) adapted by Translation Automation User Society (TAUS). TAUS error typology is used as a model to assess participants' outputs and to be evaluated by a jury of professional instructors. The findings have shown that there is an improvement in quality due to the statistical analysis of the quantitative data which have shown a significant correlation between post-edit practice (PEP) and post-edit quality (PEQ) as p value = 0.003. The statistical results imply an improvement of post-edited output quality.

Key words: post-3editong, PE, Google machine translation, GMT, error typology, TAUS, DQF

التحرير اللاحق للترجمة الالية بوصفه أداة ابداعية لتحسين جودة نتاج طلبة الترجمة

الباحثة ميس فريق شاكر

الاستاذ الدكتور كاظم خلف العلي

جامعة البصرة / كلية الآداب/قسم الترجمة

الملخص:-

يعد التحرير اللاحق للتّرجمة الآليّة على أنه طريقة لتحرير نتاج المترجم الآليّ (MT). نشأ التحرير اللاحق بعد الاستخدام الهائل لأنظمة الترجمة الآليّة في العالم الحديث ، وتحديداً الترجمة الآليّة العصبية (NMT) والتي وضعت مهارة التحرير كأحد المهارات الرئيسية التي يجب على المترجمين امتلاكها كبطاقة دخول في سوق الاعمال الخاص بالترجمة. تبحث الدراسة الحالية في مدى تحسن جودة الترجمة باستخدام التحرير اللاحق لترجمة غوغل الآليّة (Google MT) عن طريق حساب كمية ونوع الأخطاء التي ينتجها نظام الترجمة الآليّة غوغل (Google MT) ومقدار التحرير اللاحق لهذا الكم والنوع من الأخطاء حيث أظهرت النتائج (٢,٢١%) أخطاء اصطلاحية و (٨,٤٨%) أخطاء نحوية لم يتم تحريرها. شارك أربعة وأربعون طالب ترجمة في هذه الدراسة حيث تم ارسال نصًا مترجمًا الآليّاً باستخدام مترجم غوغل (Google) وتوجيهات لتحرير النص وفق معايير التحرير اللاحق للترجمة الآليّة. اتبعت الدراسة منهجية البحث المختلط لجمع البيانات وتحليلها نوعياً وكمياً ضمن إطار الجودة الديناميكي (DQF) الخاص بجمعية مستخدمي الترجمة الالية (TAUS) استخدم التحليل النوعي لنتاج المشاركين المُحرر تصنيف أخطاء (TAUS) كنموذج للتقييم قبل هيئة التقييم. اما التحليل الكمي باستخدام التحليل الاحصائي للبيانات الكمية يظهر أن هناك تحسنًا في جودة الترجمة التي تم تحريرها (PEQ) وارتباطها بشكل ملحوظ مع ممارسة المشاركين لعملية التحرير اللاحق للترجمة الآليّة (PEP) بمقدار٣ ٠ ,٠ ٠ = *p*.value.

الكلمات المفتاحية: العربية العراقية، لهجة گلت، البصرية، التسوية اللغوية، صفات فونولوجية، صفات مورفولوجية

1. Introduction

The technology has dynamically developed the world we live in. Globalization, in the same line, has changed the international markets. Translation, among many other industries, has changed in terms of producing more and fast services with good quality. Moreover, translation is not paper-based anymore and a translator may not be only a translator but a post-editor too. A post-editor should be able to use machine translation and can recognize its types and mechanism in order to understand the strengths and weaknesses in the translation they produced.

Machine translation systems (MTS) are used to help translators all over the world for fast and more productive. Then it becomes apparent that translators should have special skills to integrate with MTS to produce the final product in high quality. As a result, post-editing process becomes the trend in translation industries. And in order to understand the process, definitions, types and criteria of post-editing should be recognized.

2. Machine Translation (MT)

Toward a better understanding of the process of post-editing, Machine Translation should be defined to have an overview of the potential reason for the emergence of post-editing and its impact on translation process in general. TAUS (2019:7) defines MT as the "use of computer software in purpose translation text or speech in one natural language into another". The use of such systems alters the traditional translation process. Pym (2012:491) states that "technology is no longer just another add-on component. The active and intelligent use of TM/ MT should eventually bring significant changes to the nature and balance of all other components, and thus to the professional profile of the person we are still calling a translator". Therefore, Pym believes that traditional terminology is no longer the same such as translator or source text, where traditional translation models have been altered from identifying skills and generating solutions for translation problems towards selecting from the available solutions in case of using translation technologies. Hence, new strategies need to be developed in order to adopt in the technological environment (Pym, 2012:492).

In addition, Quah believes that MT is "an interdisciplinary enterprise that combines a number of fields of study such as lexicography, linguistics, computational linguistics, computer science and language engineering" (2006:57). The notion behind MT is that the machine is able to create a translation without any human intervention. Quah explains that the aim

of MT is to create translation automatically without any role of human in the process of generating automatic translation, but the fact that MT cannot generate a high-quality output the same of human translation quality makes the need for the interaction of humans to fit the purpose of translation. The intervention of humans is enrolled before or after the translation process (2006:7).

The most recent and complex system among machine translation systems is Neural Machine Translation (NMT). NMT uses algorithms to imitate the biological neural networks work. First, NMT is successfully applied in image and voice recognition. Later, NMT system has raised the challenge to overcome the quality of SMT. NMT adapts learning method to train large networks of neurons to predict the next word in the target text which improve the quality and fluency of the MT outputs (Zhang et al.,2017:2425). Bahdanau et al. (2015:1) define NMT as a new approach of MTS that "build and train a single, large neural network that reads a sentence and outputs a correct translation". NMT shows high promise regardless of the fact that this approach is the early development stage.

The mechanism of NMT consists of several models that are trained jointly (end-to-end). It starts with encoding the sentence into vectors by what is called RNN (Recurrent Neural Network) focusing on individual word to send to another RNN to decoding to predict the target word. Multiple encoders and decoders are used in NMT. NMT is able to learn and translate which makes it a promising approach (Wu et al.2016:1-2). Another advantage of this system is Deep Neural Network (DNN) which represents syntactic and semantic representations. NMT can translate a language which has not been dealt with before on the basis of previous gained knowledge.

Further researches and contributions in NMT field are still in constant development. Shterionov et al. (2020:67) propose an automatic post-edit method based on neural method in particular deep learning. They analyzed fifteen different systems using the new methods in a commercial translation setting and concluded that there is significant effect on translation quality of NMT with the use of automatic post-edit. Recently, Microsoft GSX (Global Service Exchange) Language Technology and The Centre for Digital Content Technology (ADAPT Center) collaborate to design a project to examine the usage of neural PE in a commercial setting and using industrial standard data. The upcoming development may reveal more automation in the translation industry.

3. Post-Editing: Definitions and Nature

Post-editing (PE) is the process of correcting an automatic machine translation output. This correction depends on the aim of the translated text. Post-edit (ing), according to Veale and Way (qtd. in Allen,2003:298), is a "term used for the correction of MT output by human linguists/editors". Wagner (qtd. in Allen,2003:298) states that "post-editing entails correction of a pre-translated text rather than translation from scratch". Furthermore, European Standard for Translation Services (2004:5) defines post-editing as "the examination and correction of the text resulting from an automatic or semi-automatic machine system (machine translation, translation memory) to ensure it complies with the natural laws of grammar, punctuation, spelling, and meaning, etc".

An additional definition by Allen (2003:297) explains post-editing as a task related to MT and differs from translating or reviewing. Pym (2011:88) defines post-editing as "the process of making corrections or amendments to automatically generated text, notably machine-translation output". The main aim of post-editing process is to improve the machine translation output quality depending on the purpose of the translated text. Schäfer (2003:3) describes post-editing as "the task of polishing up the raw MT output to an acceptable, end-user friendly text quality". Post-editing is the process of 'fixing' MT output to bring it closer to human translation standard.

In general, Allen (2003:299) states that many factors create the need for post-editing in translation. These factors are commercial and marketing needs in the new localization industry where companies – whether small, medium; or large – cannot rely on a single language as a way of communicating or marketing. The increasing demand for translation forces many companies to develop their tools in order to meet their translation need with less time and cost. Hence, the use of MT and PE is increased for these companies. Another factor is perspective concerning the quality and the type of the translated text. In such case, the aim of the translated text determines the need of post-editing. The level of post-editing task depends on the quality of the output, the text type and the purpose of the target text with regard to target audience (Allen 300). Vasconcellos (1986:411) declares that post-editing is "adjusting" MT output that reproduces accurate meaning of the source text. According to

Vasconcellos (1986:140), post-editing is "an indispensable element of MT".

Schäfer (2003:4) explains post-editing as a linguistic task and divides the process into three stages: General output check, Editing the MT output, and Proofreading. Another suggestion of the nature of PEMT (post-edited machine translation) process is by Krings (2001:165-166) who states two ways that translation process phases, even if not changed, are distorted. First, reading phase might be interrupted by the raw MT, as well as the process may start with reading MT output rather than the source text. Second, the equivalency search processes may be replaced by check and correct process on the equivalent text already provided by MT. Carl et al. (2011:140), on the other hand, notice that the attention is shifted from source to target side which contrasts the source text fixation in translation process.

Accordingly**,** post-editing can be done in two levels according to the purpose of translated text which suits the client, company or instructor. The level of post-editing depends on how many errors that post-editor corrects and the types of these errors. As mentioned above, there are two levels of post-editing: light and full post-editing.

3.1. Light Post-Editing (Rapid): according to Allen, light post-editing is where the "post-editor ensures there are no linguistic or terminology errors or mistranslation. Its main purpose is to make the text understandable without altering its style" (2003:297). Additionally, it requires the minimal number of corrections and modifications as possible due to the purpose of the translation to be understandable and grammatically correct. The main task here is to correct the most obvious grammatical errors, typos, ambiguity sentences. In addition, unnecessary translation alternatives by the machine should be deleted. The main purpose of light post-editing is the meaning of the source text where the concept of the original can be found in the translated text. The post-editor should only give attention to the major errors and critical errors while ignoring all stylistic modifications (Densmer,2014).

3.2. **Full Post-Editing (Polished)**: in contrast to light post-editing, full post-editing is the stylistic checking to be read by native readers (Allen,2003:306). The quality of the translated text of machine output needs to be as close as possible equally to human quality. It needs more time and attention to be given in order to read the translated text as it is written in the target language. It should be free from any grammatical

errors as well as typos, punctuation errors, and spelling mistakes. Moreover, the post-editor should give attention to cultural references, stylistic and fluent of the translated text (Densmer,2014).

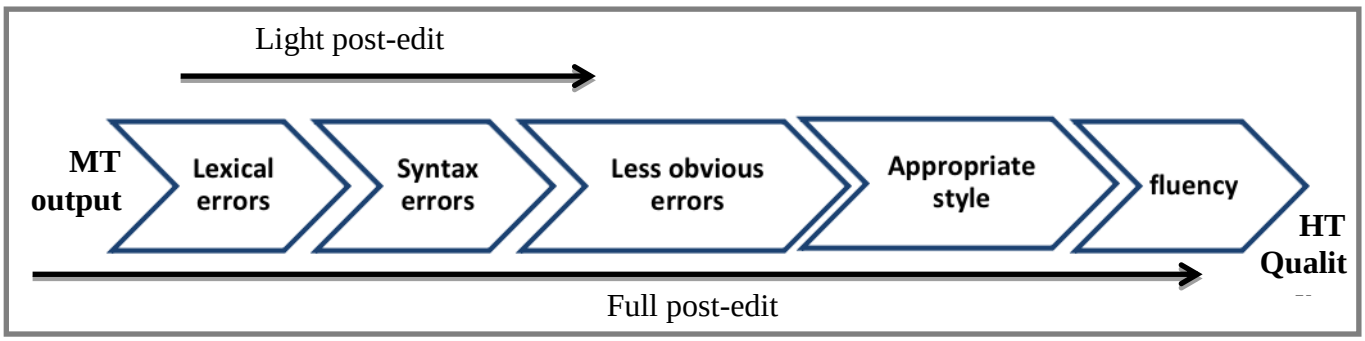


Figure (١) Types of Post-Edit qtd from CSA

4. The Post-Editor

On many occasions, the post-editor is characterized as a linguist or translator which means s/he should be a qualified person to do the task. The post-editor's task is not only checking the machine output. Schäfer (2003:3) summarizes the task of the post-editor in identifying errors produced by the machine. Hence, these errors are usually typological and recurring. The post-editor should analyze the MT output to recognize these errors to facilitate the task. Another point of view sees the post-editor carrying a superior task which even good translators may not be able to manage. For instance, Offersgaard et al. (2008:155) mention "good translators are not necessarily good post-editors." As such, good post-editing skills differ from good translation skills. On the other hand, Johnson and Whitelock (1987:149) state that post-editors need to be skilled in:

- the subject area
- the target language
- the text-type
- contrastive knowledge

The post-editor is evaluated according to performance considering the efforts, amount and types of errors and time. Vieira et al. (2018) outline an instrument to test the post-editor performance and list a number of skills that would help to indicate PE performance. They proposed modules to state a diagnostic tool that test a productivity of post-editor. The test consists of the following modules:

1. keyboard skills

2. problem-solving/decision-making skill
3. editing skill
4. perception of productivity
5. following guidelines
6. background questions.

5. Revision vs. Post-Editing

Both tasks are the same, primarily as a process of errors correction. Krings (2001:4) believes that post-editing is "logically parallel to revision of human translation". However, both can be mainly distinguished and differentiated by the type of errors, the way of correction and the most obvious difference between revision and post-editing is their definition that revision is checking and correcting the human translation. On the other hand, post editing as explained before is "correction of machine translation output". In contrast, revision, an integral part of translation, is defined as "the process of checking a draft translation for errors and making appropriate amendments" (Mossop,2016:168-169).

In addition, Dimitrova (2005:106) defines revision as changes to the TT made by translators both during the writing or the post-writing phases of a translation task. Editing a human translation is more commonly referred to as 'revising' (Somers,2003:199), while post-editing involves "corrections of a pre-translated text rather than translation from scratch" (Wagner,1985:1). Another definition of revision by revision Manual of the European Commission Directorate-General for Translation (2010:6) is that revision is "comparison of a translation with its original, in order to point out and/or correct possible shortcomings, both in terms of content and formal presentation". The aim of revision is to improve translation quality and provide training for translators and revisers (Revision Manual,2010:6), whereas post-editing aims to improve the quality of the MT output and produce high quality translated text in less time.

Krings (2001:33) states that some translators see MT as a threat that would steal their jobs or as Krings describes a "job killer". In a psychological point of view, Laurian (1985:83) has the same opinion of translator's fear of being replaced by a machine. An investigation is made by Fulford (2002) among UK translators. Fulford uses discussion and focus groups to know translator's attitudes and perceptions toward MT. The major opinion about MT is that translation is a complex task which cannot be done by a machine. This negative attitude may not give

any chance to MT to prove its capabilities (Fulford,2002:120). As a result, more MT and PEMT training courses are needed. At TED (Technology, Entertainment, Design, for short) conference 2018, the computer scientist, Kai-FuLee, declares that intelligence machines may take over routine jobs but not the creative jobs because it can "optimize but not create". Human can work with machine in creative fields to produce better results.

One of the pioneer researchers of the field is Sharon O'Brien. O'Brien (2002) describes the need to train translators with post-editing skills. She discusses the need of a training course to have two components: a theoretical and a practical component. The former covers knowledge of MT, and the latter component covers post-editing practice. O'Brien has carried out several studies exploring various aspects of PEMT. In O'Brien's Doctoral dissertation at Dublin City University (2006), she studies the cognitive effort in the process of post-editing of nine professional translators by mixing two methods to measure the cognitive effort: first, Translog is software that records all key strokes and mouse movements with time. Second, Choice Network Analysis (CNA) is "a method for constructing models of the mental processing underlying translation" (O'Brien,2006:11).

Martínez (2003), on the other hand, examines whether full PEMT provided output faster than translating the same text by humans only. Martínez, in her MA dissertation, explains the relationship between time and productivity in PEMT compared with human translation of Marketing Brochures by professional translators. The study based on Allan's methodology (2001) of several tests. The results show that PEMT saves time precisely 5-6 min every 100 words. Furthermore, suggestions are obtained for PE guidelines to help improving the quality of MT outputs (Martínez 59-61). Martínez concludes that PEMT is affected by number of conditions and limitations such as PE feature, PE translation environment, using the appropriate MT approach, complete MT PE process, and dictionary preparation time.

Guerberof's PhD thesis (2012) investigates the quality and productivity in using translation memory systems and PEMT. Guerberof (2012) conducts an experiment to examine the differences in productivity and quality. The correlation of number of errors and participants' speed and experience shows that post-editing pre-translated segments is notably faster than editing translation memory segments. Yet there is no

significant difference in case of correlating technical experience with number of errors. Guerberof and Mookrans (2019) suggest a descriptive paper of the development of PEMT and its types. Guerberof and Mookrans (225) present the main challenges teaching PEMT in the classroom that PEMT needs qualified translators, not a student who lacks knowledge of error classification. In addition, students are not necessarily interested in translation technology and PE. These challenges might be changed that now novice translators are more exposed to MT and tend to accept the quality of MT. Hence, an emphasis must be made on the quality of the final product and traditional translation skills to overcome the low MT quality and manage PEMT in light of translation aspects such as purpose, equivalence and fidelity.

In the annual conference of the European Association for Machine Translation, DePraetere (2010) reports a case study with the same conclusion before in a study of ten novice translators accept errors and mistranslation when they read MT text fluently due to the common use of MT and interaction with the social media. DePraetere (2010) outlines possible guidelines for post-editing that might help translators to improve their skills in post-editing. Her analysis of ten students' post-editing data marks stylistic changes. In conclusion, she suggests that post-editing should mainly be concentrated on MT error analyses. DePraetere (2010) also analyzes 2230 words post-edited by novice translators. The analysis indicates that some students skip errors that should be corrected, which shows that novice translators have a different conception of post-editing task.

6. Post-Editing in the Arab World

The use of translation technology in the Arab world seems to be under consideration. It is reflected in the lack of using these technologies within professional job either because of the lack of the positive attitude towards these technologies or due to the lack of training courses in the field. Researches on such topics and problems are limited as far as Arabic is concerned. One of the researches addresses the problems and gaps in training professional translators to be integrated with technologies.

Izwaini (2006) investigates the problems of Arabic MT considering three online systems Google, Sakhr and Systran. Izwaini (118) presents the problems due to the origin of language pair Arabic and English that came from two unrelated families. It has been noted that there are many

challenges in linguistic level between Arabic and English. For instance, Arabic names have meaning and the diacritics "al-tashkiil" can change the meaning. Also, Arabic sentences are either nominal (SVO) or verbal (VSO), while English sentences are mostly nominal (SVO). Other challenging issue is that Arabic uses only two pronouns for genders (feminine/masculine) whereas English has gender-neutral pronouns (Izwaini 121-129).

Izwaini (2006) argues that Arabic Machine Translation systems are in the developing stage that MT would be considered acceptable as far as it minimizes post-editing and produces high quality output. He concludes that "the less post-editing required, the more successful the translation is, and the less time is spent, and less work is done to produce the final translation" (Izwaini 146-147).

Sabtan (2020) recently presents a paper discussing Arabic machine translation to student translators in Oman. The participants of the study are asked to post-edit raw machine translations (Systran, Babylon and Google Translate), and identify linguistic errors in MT outputs of the three online translation systems. The paper concludes that participants are able to recognize almost all linguistics errors and produce a translation that equal to human translation. Sabtan (2020) closes with the idea that the market's need in the future is to incorporate MT courses in translation departments in the Arab world which will gain a countless result on training student to be prepared for future career. The comparative study of the three translation systems (Systran, Babylon and Google translate) shows that among seven errors made by MT six errors (42.85%) made by Systran and Babylon in equal, while one error (14.28%) are made by Google Translate (Sabtan,2020:194-195).

As a conclusion, machine translation in general and post-editing in particular are noticeably a new trend in the Arab world. Recently, several attempts are shown to spot the light on the problems and difficulties of training machine translation engines and training translators to meet the new criteria of professional translators in global market.

7. Methodology

This study explores skills of post-editing Google neural machine translation (GNMT) by adapting TAUS Dynamic Quality Framework (DQF) model. The study is a mixed-method approach as it is seen as a way to integrate the best of both (quantitative / qualitative methods). In addition, the collected data makes it conceivable to give general

conclusions and obtaining information on participants' knowledge and competence in post-editing and their correlation with the quality of translation product. Furthermore, such a method helps avoid bias. At first, an approval (appendix A) is signed by the Dean Assistant for Scientific Affairs / College of Arts, University of Basrah to conduct an online test via internet. Admission is approved by Chairman of the Department of Translation. An online test is demanded as the social distance is made imperative due to the Covid-19 pandemic. Then, a Telegram channel with the name *Post-Edit Machine Translation* is created (join link *http://t.me/pegmt*)[1] with description including the title and main topic of research, general definition of post-edit and the researcher's name. The first contact in the group is made to welcome participants warmly and friendly express researcher's gratitude to their time and contribution. Furthermore, overview introduction and general definition of MT and PE are explained in order to clarify the topic and ensure that they are aware of the process and its procedures within a week.

First, participants received an online informed consent letter (Appendix B) to be signed, then participants are asked to respond to the questionnaire (Appendix C). At last, participants received pre-translated text by Google Translate (Appendix E) and are asked to post-edit the text in the sense of comprehension, fluency, grammatical and lexical errors. The post-editing required is light PE where TAUS (2014) illustrates that light PE conveys the total meaning of ST, while only major errors of grammatical and lexical errors are the main concern to be corrected.

Keeping in mind the aims of the study and further pedagogical aims, the study is expected to investigate post-editing practice by fourth-class translation students and the impact it has on translation quality for their final products. For purpose of study, data are collected from both questionnaires and final drafts post-edited by participants. A set of questions are set up and included in a questionnaire, post-edit Google NMT outputs of selected texts, and assessing the quality of final product of post-edited translations of participants. Frey et al. (2000:110) state the order of the procedures as initial contact, survey, instructions, questionnaire and PE session and make sure that all the data of the participants are analyzed with consistency. Translation product data are analyzed then assessed by a jury of Translation professors in Translation Department/ University of Basrah within TAUS Dynamic Quality Framework (Appendix F).

According to Schäfer (2003:133), error typology can serve as a research methodological framework and as a diagnosis tool to identify corrections made in post-edited output. TAUS Dynamic Quality Framework (DQF) is the newest and most relevant to Machine Translation TQA. It is launched on 2012 by Sharon O'Brien in cooperation with TAUS. DQE model is the most related model based on TAUS error typologies that fits PEMT researches. In 2013, TAUS holds Translation Quality Evaluation Summit organized by Microsoft where 16 enterprise members shared their knowledge of DQF framework and tool and development of TAUS platform one of its objectives is to familiarize participants with the DQF framework. (Anne-Maj.2012 at https://www.taus.net).

According to O'Brien (2012:60), the most common categorized errors are: language, terminology, accuracy; and style, while severity levels can be categorized as: minor, major, and critical. The following table (1) is quoted from TAUS Error Typology Benchmark template of DQF:

Table 1

TAUS DQF Model: Error Categorizations

High-level	Granular levels
Accuracy	Addition Omission Mistranslation Over-translation Under-translation Untranslated Improper exact TM match
Fluency	Punctuation Spelling Grammar Grammatical register Inconsistency Link/cross-reference Character encoding
Terminology	Inconsistent with term base Inconsistent use of terminology

Forty-four students in their fourth year of Translation Department at University of Basrah are participated, 19 males and 25 females. Although most participants are newly introduced to the term PE, they state that they practice PE (24.6% agree and 45.6% fully agree) and

widely use MT, particularly, Google Translate (36.8% agree and 24.6% fully agree).

8. Data Analysis

The statistical analysis of the questionnaire administrated by Google Forms[2]- shows that (25.5% are strongly agree) and (40% are agree) to the question of familiarity to machine translation systems, while 1.8% is not familiar with MTS as the Figure (2) below shows.

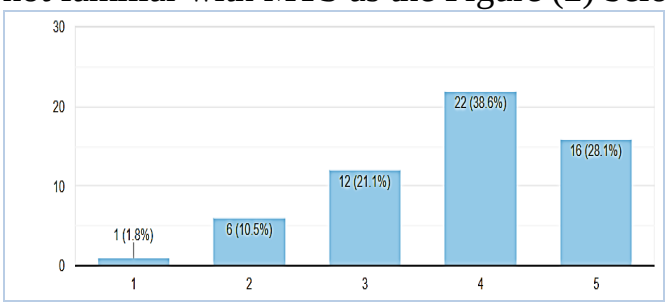


Figure (2) Familiarity to MT

For the usage of Google Translate in participants' daily life, participants have answered for agree 36.8% and fully agree 24.6%, whereas 3.5% answered with fully disagree and 22.8% never used Google as shown in Figure (3) below:

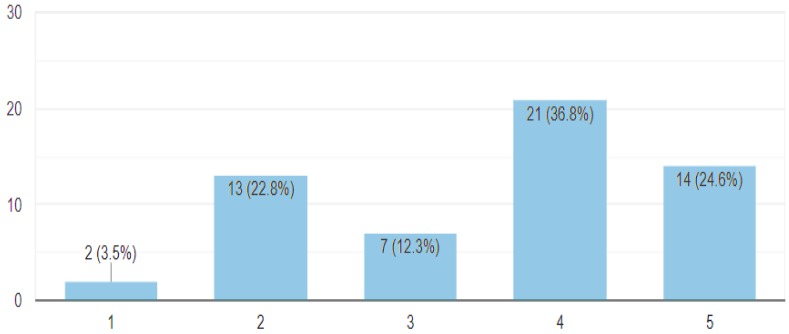


Figure (3): Translation Students' Usage of Google Translate

The participants' use of Google Translate is around 61.4%; they are fully agree to practice PEGMT output around 46% and agree for 25% (total agreement 71%). Also, participants show their interest in PE in percentage of 77.2% in Figure (4). Consequently, they tend to frequently use PE on many occasions as it is shown in Figure (5) where 21.1% and 43.9% of participants show their agreement of using post-edit in their daily life.

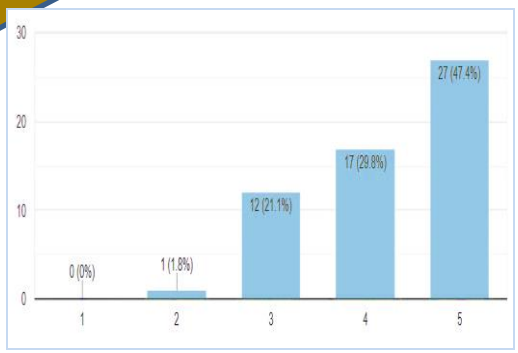


Figure (4) Interested in PE

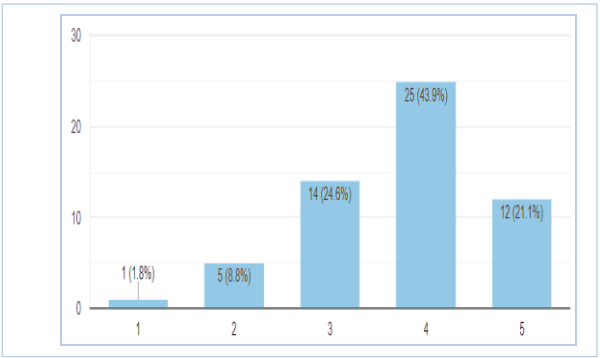


Figure (5) Frequency of Use PE

The text is divided into segments in order to analyze and classify errors according to accuracy, fluency and terminology categories. The first segment includes three errors that belong to accuracy and terminology. GMT translates the word 'considerations' as 'اعتبارات' while it is best translated as 'ارشادات' or something related to this meaning such as 'توجيهات'. In the same segment, 'masks' is translated by MT as 'الأقنعة' while it refers to 'كمامات'. In addition, the term 'respirators' is translated as 'اجهزة تنفس'. The term is defined by Lexico[3] as "An apparatus worn over the mouth and nose or the entire face to prevent the inhalation of dust, smoke, or other noxious substances" and "apparatus worn over the face to warm, filter, or purify inhaled air (Oxford English Dictionary.3155), which means that the term may refer to special type of masks. As it is denoted in AL-Mawrid Dictionary (2008:988) as: (١) 'الكِمامة: قناعٌ مانعٌ لاستنشاق الغازات الضارة او السامّة'.

ST	GENERAL CONSIDERATIONS ON THE USE OF MASKS AND RESPIRATORS
MT	اعتبارات عامة بشأن استخدام الأقنعة وأجهزة التنفس

The second segment includes untranslated terms such as 'SARS-CoV-2' and 'COVID-19'. However, the Arabic formal system prefers the VSO unlike the English one (SVO). As consequence, the verb 'spread' may be initially moved to precede the Arabic sentence 'ينتشر'.

ST	Like most respiratory viruses, SARS-CoV-2 (the virus that causes COVID-19) is principally spread by respiratory droplets
MT	الفيروس المسبب لـ SARS-CoV-2 (COVID-19) مثل معظم فيروسات الجهاز التنفسي، ينتشر بشكل أساسي عن طريق الرذاذ التنفسي

The third segment, as previously mentioned, has two failures in machine translation version that is 'with a surface' means to touch a surface and in Arabic is better to translate preposition 'with' with 'لـ' instead of 'مع'.

Another machine error is that 'virus-containing respiratory droplets'. The phrase is complex and yet is grammatically mistranslated since 'تحتوي=containing' should be referred to 'surface =سطح' and 'سطح' is a masculine that should be referred to as 'يحتوي'. Meanwhile, the word 'droplet' is preferred to be translated as 'رذاذ' rather than 'قطرات'. In general, the phrase 'virus-containing respiratory droplets' has the head noun 'droplets' which contains a virus.

ST	Contact via hands with a surface contaminated by virus-containing respiratory droplets
MT	عن طريق ملامسة اليدين مع سطح ملوث بالفيروس- تحتوي على قطرات تنفسية

To conclude, the MT output has twelve errors which are diagnosed according to TAUS DQF model of error typology[4]. The Post-editing of participant should consider these errors which are the accuracy, fluency, and terminology in order to produce a 'light' post-editing for 'good enough' quality.

8.1. Participants' Post-Editing Machine Translation (PEMT) Output

Here, the final drafts received from the participants are qualitatively analyzed segment by segment and are assessed by the jury identified by the Department of Translation. The first segment, as mentioned previously, includes three errors supposed to be post-edited. Due to space issue, it is applicable to present the first segment analysis for participants' post-edited output to show the procedures of analysis and counting errors.

ST	GENERAL CONSIDERATIONS ON THE USE OF MASKS AND RESPIRATORS
MT	اعتبارات عامة بشأن استخدام الأقنعة وأجهزة التنفس

The first error is 'Considerations'. Out of 44 participants, seven kept the term as it is 'اعتبارات' (P.9, P.16, P.17, P.34, P.36, and P.39), while others replace the lexis with 'دراسات/دراسة' such as P.3, P23, P.24, P.27 and P.28. However (P.4), (P20), (P.21) and (P.40) use the word 'نظرة عامة' instead. The words 'ارشادات' and 'توجيهات' are more accurate in meaning and the context of the selected text. The assessment shows that (P.8, P.13, P22, P.31, P32, P38, P.41, and P.43) replace 'اعتبارات' with 'ارشادات' while (P.7) and (P.33) use the word 'توجيهات'. P.12 finds that 'توصيات' could fit the context.

Two other errors are indicated in the first segment 'masks and respirators' which are translated by Google as 'اقنعة واجهزة تنفس'. In order

to clarify the meaning, ‘masks are covering for all or part of the face as a disguise or for protection against infection etc’ (Oxford English Dictionary,2009:2217) and ‘respirators’ has different meaning all related to respiratory system, but one of these meanings is ‘apparatus worn over the face to warm, filter, or purify inhaled air’ (Oxford English Dictionary, 2009:3155).

However, many participants failed to edit the word ‘respirators’ while it is easy to edit ‘mask’ into ‘كمامة’ as it is a more common due to Covide-19 pandemic. 37.7% of participants translate ‘masks’ into ‘كمامات’ and left ‘respirators’ as ‘اجهزة تنفس’ whereas four of these participants add ‘اصطناعية /صناعية’ to the phrase to become ‘اجهزة تنفس صناعية’ or ‘ اجهزة التنفس الاصطناعي’ which denote a different meaning referring to ‘a device for maintaining artificial respiration’ (Merriam-Webster,2015).

Furthermore, 35.5% of participants neither post-edit ‘mask= اقنعة’ nor ‘respirators=اجهزة تنفس ’, the two terms remained as they are in the MT output. Conversely, 17.7% of participants post-edit both terms in different ways such as (P.7) comes out with ‘ توجيهات عامة حول استخدام الاقنعة والكمامات’. Other editions are ‘ارشادات عامة لاستخدام الكمام واقنعة التنفس’ by (P.13) and ‘البروتوكولات العامة لاستخدام اغطية الوجه والكمامات’ by (P.19).

Likewise, (P.22) produces the following sentence ‘ ارشادات عامة بشأن كيفية استخدام الكمام والاقنعة’. Besides, (P.7), and (P.37) submit the following consecutively ‘توجيهات عامة حول استخدام الاقنعة والكمامات’, ‘نطاق واسع بشأن الجوانب العامة في استخدام الكمامات والاقنعة’. Also, (P.39) presents ‘اعتبارات شائعة بشأن استخدام الكمامات واقنعة التنفس’ and (P.41) reproduces the segment as ‘ارشادات عامة بشأن استخدام الكمامات الطبية والاقنعة’. These four participants produce acceptable meaning which is close to the source text meaning.

Three participants (P.4, P.20 and P.42) use deletion to overcome the term. The figure below shows the number of participants that post-edit ‘masks and respirators’ in the first segment.

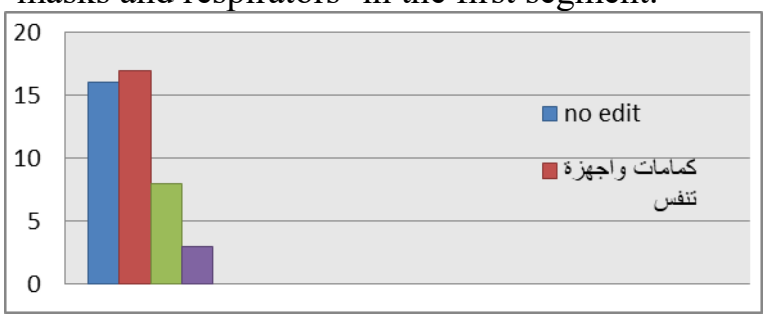


Figure (6) Post-Edit ‘masks and respirators’

To score the previous error corrections for participants, DQF A score table by TAUS is adapted to fit the present study. The quality requested is 'good enough' that results from 'light PE' by the participants. The score depends on errors number of GMT output and their severity where twelve errors selected as six major and four minor errors and two as neutral classified under three categories (accuracy, fluency and terminology).

Six errors should be post-edited by the participants to pass the evaluation score. The scores of the participants according to their number of corrections (post-edits) show that 27% (12) of participants fail to post-edit more than 6 errors of GMT output. In contrast, participants (P.1, P. 7, P.8, P.13, and P.41) mark the highest scores.

Compared to the Google MT errors, the post edited versions of MT outline the severity of the errors of the participants' outputs. The numbers show no critical errors, and 82 (37.1%) major errors are not corrected. The majority of errors in the post-edited outputs belong to fluency as 48.8% of the errors occurred in the final post-edited outputs.

To assess the quality of the post-edit outputs, DQF counts the number of corrections made by the participants for each error they located. The scores show that 12 (27%) students have minimum scores; (P.4) and (P.18) score only two as they post-edit only two errors in the text. In contrast, only (P.41) correct 11 errors out of 12 and pass the quality assessment with 95% score as it is presented in Table 2 for the percentage of post-edit quality.

Table 2

Participants' Scores According to Their Post-Edits Numbers

(*Accuracy = A, Fluency = F, Terminology =T)

Part. No.	A	F	T	Score	Part. No.	A	F	T	Score
P.1	5	4	2	10	P.23	3	2	1	6
P.2	4	2	1	8	P.24	2	3	0	5
P.3	4	2	0	6	P.25	5	3	0	8
P.4	1	1	0	2	P.26	4	3	1	6
P.5	3	2	1	6	P.27	4	2	0	6
P.6	5	4	0	9	P.28	3	4	0	7
P.7	5	3	2	10	P.29	2	2	1	5
P.8	5	3	2	10	P.30	3	0	0	3
P.9	1	1	0	3	P.31	4	2	0	8

P.10	4	2	1	8	P.32	3	1	0	3
P.11	3	2	0	5	P.33	3	3	1	6
P.12	3	2	1	6	P.34	3	3	1	7
P.13	5	3	2	10	P.35	2	3	0	6
P.14	3	1	1	5	P.36	2	1	1	5
P.15	2	2	0	3	P.37	4	3	1	8
P.16	5	2	1	8	P.38	4	2	1	7
P.17	4	4	1	9	P.39	5	2	2	9
P.18	1	0	1	2	P.40	4	0	1	5
P.19	4	2	1	8	P.41	5	4	2	11
P.20	4	3	1	7	P.42	5	3	1	10
P.21	5	3	1	9	P.43	3	3	1	7
P.22	3	3	2	8	p.44	3	3	1	7

Each segment presents source and GMT output in order to be assessed by the jury. The Figure (7) presents the assessment of post-edited output by the jury in terms of adequacy (A) and fluency (F) in scale of 4 ranks. The adequacy rank is represented and clarified to the jury as (None =1, Little =2, Most =3, Everything=4), while fluency rank is represented (Incomprehensible =1, Disfluent =2, Good =3, and Flawless=4). As a result, four participants (P.4), (P.18), (P.35), (P.40) take the lowest score of assessment (P.4), (P.18), (P.35), (P.40) and respectively they score for PEQ 30%, 50%, and 45%.

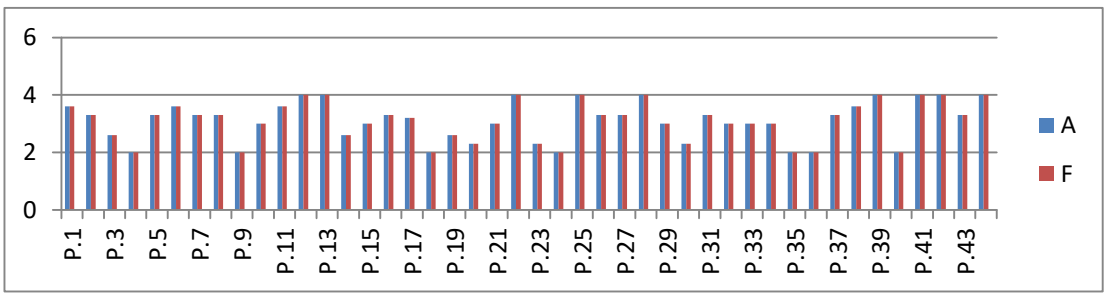


Figure 7: Jury Assessment of Participants' Post-Edited Outputs

The post-edit quality (PEQ) is the result of the assessments and error analysis of each participant to formulate the final evaluation results as a PEQ percentage. 15 participants failed to produce a 'good enough' quality as they produce lower than 60%. By contrast, 20 participants score more than 70%. PEQ rate for participants shows that (P.41) rates the highest PEQ percentage, while (P.4) and (P.18) rate the lowest percentage.

8.2. Quantitative analysis

The statistical procedure is engaged to investigate correlation between the quality of participants' post-edited outputs (PEQ) in accordance with DQF of two characteristics and participants' post-edit practice (PEP) extracted from the questionnaire. The statistical results of the variables of adequacy shows that *p*.value .014, .015, .031, .015, .017, .026 are less than α =0.05 which reveals a significant improvement of the adequacy of participants' post-edited outputs. On the other hand, fluency has a significant correlation with participants' post-edit practice, where *p*.value 0.01, 0.04, 0.03 which show a significant correlation with fluency.

An overall picture of the correlation between the post-edit quality (PEQ) and post-edit practice (PEP), the statistical analysis marks a significant correlation between PEQ produced by participants and PEP of the same participants. ANOVA presented in Table (3) shows that the post-edit has a significant impact on the quality of post-edited outputs presented by translation students in the current study. The Analysis of Variance shows that the *p*.value (sig .003 <0.05) shows that there is significant correlation with PEQ.

Table (3)

Analysis of PEQ and PEP

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2070.778	1	2070.778	9.800	.003[b]
	Residual	8875.012	42	211.310		
	Total	10945.790	43			

a. Dependent Variable: PEQ A/F

b. Predictors: (Constant), PEP

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	27.703	11.768		2.354	.023
	PEP	10.255	3.276	.435	3.130	.003

a. Dependent Variable: PEQ A/F

Both qualitative and quantitative analysis of data are accomplished. First, the qualitative analysis of GMT output is to indicate the basic errors and their severity and then the qualitative analysis of participants' drafts. Second, the quantitative analysis statistically achieves a significant correlation between PEQ and PEP to formulate the final results of the study.

9. Conclusions

The present research studies the post-editing of translation students for GMT output and examines the quality of their final drafts. The study explores their post-edits of GMT and shows that almost 65.9% of participants use Google Translate in their assessments while 56.8% attend to do post-edit in their daily assignments. The study concludes that 47(21.2%) terminology errors (related to the source language) have not been corrected and 108 (48.8%) grammatical errors (related to the target language) are the main problems student face in their post-edit of GMT, where 34 (77.2%) of participants ignored word order preference of formal system of Arabic (VSO). On the other hand, the definite article existed in the Google MT output is also ignored by 38(86.3%) of participants.

Results show that 68.1% translation students are interested in PE. However, the correlation of students' interests and their quality is statically significant where *p*.value is 0.016. Thus, this raises the need for specialized course in PE to familiarize students with the process of PE and its advantages as well as error analysis and error typology since almost 38.6% cannot detect errors in Google MT which leads to uncorrected errors in their final drafts. It seems to be that the academic and pedagogic aim is the main beneficiaries due to the applicability of research results.

Since the PE course is eliminated because of general circumstances and changes within the whole Iraqi university system, the study results suggest formulating a designed proposal for PE course with particular reference to the English-Arabic language pair. PE activity should be a part of novice translators' university life to familiarize them with the new market challenges and demands and be more aware of the loss and gain in using MT as well as developing their ability to identify the problematic errors to be corrected which lead to the improvement of quality and saving effort and time.

The study also shows that translation students can produce a 'good enough' quality (according to TAUS) in post-editing GMT output even without any training or special courses as it is showed that 20 participants have more than 70% in their PEQ rate, and 9 participants score between 60-70% in PEQ rate. 15 students score the lowest rate for PEQ rate, which leads to the significant correlation of PEQ and participants' practice, attitude and competence in post-edit where *p*.value (0.023, 0.003) shows the statically significant results. In total, the

statistical analysis of quantitative data produces a significant correlation between PEP and PEQ as *p*.value = 0.003 which implies an improvement of post-edited output quality.

The present study opens up further suggestions within the topic of PEMT where various texts type may be considered for more generalizable findings. Another possibility is to use screen recording or TAPs in order to measure time and effort to explain the process of PE and outline the main strategies students may apply to overcome difficulties and problems. Following the same procedures, other MT software could be used in translating (SDL Trados, SYSTRAN, Amazon Translate, PROMT Translator, Babylon NG, Microsoft Translator, etc.). The results could be compared to Google Translate findings and conclude the best MT software for the English-Arabic language pair. Also, the findings may differ if monolingual PE / bilingual PE are concerned that investigate the amount of post-edit with or without the source text.

Reference

Al-Baʿalbakī, Munīr, and Ramzī M. al-Baʿalbakī. 2008."al-Mawrid al-hadeeth: a modern English-Arabic dictionary." Dar El-Ilm Lilmalayin. Beirut: Lebanon.

Allen, Jeffrey. 2003."Post-editing." Benjamins Translation Library.

Bahdanau, Dzmitry, Kyunghyun Cho, and Yoshua Bengio. 2015."Neural machine translation by jointly learning to align and translate." *Preprint.*

Carl, Michael, et al. 2011."The process of post-editing: A pilot study." Copenhagen Studies in Language.

Chan, Sin-wai, ed. 2015. "Routledge encyclopedia of translation technology". Routledge, 2014.

Definition, Counterfeit. "Merriam-webster. com." *Merriam-Webster*. https://www.merriam-webster.com/dictionary/respirator (Web.11th Nov. 2020).

Depraetere, Ilse. 2010."What counts as useful advice in a university post-editing training context? Report on a case study." In EAMT: proceedings of the 14th annual conference of the European association for machine translation, Saint-Raphaël, France. https://www.aclweb.org/anthology/2010.eamt-1.11.pdf.

Densmer, Lee. 2014. "Light and Full MT Post-Editing Explained." Rws Moravia Blog .com. Available at http://info.moravia.com/blog/bid/353532/Light-and-Full-MT-Post-Editing-Explained Web. at 2nd Jun. 2020.

Englund Dimitrova, Birgitta. 2005.''Expertise and Explicitation in the Translation Process''. Amsterdam/Philadelphia: John Benjamins.

European Committee for Standardization.2004. "Translation service-service requirements". DraftprEN15038. Available at http://web.letras.up.pt/egalvao/prEN-15038.pdf (web. 2nd Dec.2019).

European Commission Directorate-General for Translation. 2010."Revision Manual". Brussels & Luxembourg.Spanish Department.

Frey, Lawrence, Carl H. Botan, and Gary Kreps. 2000."Investigating communication". NY: Allyn & Bacon.

Fulford, Heather.2002."Freelance translators and machine translation: An investigation of perceptions, uptake, experience and training needs." 6th European Association of Machine Translation Workshop.

Guerberof Arenas, Ana. 2012."Productivity and quality in the post-editing of outputs from translation memories and machine translation". Doctoral dissertation.

Guerberof Arenas, Ana, and Joss Moorkens. 2019. "Machine translation and post-editing training as part of a master's programme." Jostrans: The Journal of Specialised Translation. ADAPT Centre.Dublin City University. available at https://www.jostrans.org/issue31/art_guerberof.pdf (web. 3rd Nov. 2020).

Izwaini, Sattar. "Problems of Arabic machine translation: evaluation of three systems.2006." The British Computer Society (BSC), London.

Johnson, Rod, and Pete Whitelock. 1987."Machine translation as an expert task." Readings in Machine Translation.

Krings, Hans P. and Koby, Geoffrey S. 2001. "Repairing texts: empirical investigations of machine translation post-editing processes". Vol. 5. Kent State University Press.

Laurian, Anne-Marie.1984."Machine translation: What type of post-editing on what type of documents for what type of users." 10th International Conference on Computational Linguistics and 22nd Annual Meeting of the Association for Computational Linguistics.

Lee, Kai-Fu.2018. "How AI Can Save Our Humanity". TEDx conference. available at https://www.ted.com/talks/kai_fu_lee_how_ai_can_save_our_humanity (web accessed 28th Jan. 2020).

Martínez, Lorena Guerra.2003. "Human Translation Versuv Machine Translation and Full Post-editing of Raw Machine Translation Output".

Mossop, Brian. 2010. "Revising and editing for translator". St. Jerome.

O'Brien, Sharon. 2002."Teaching post-editing: a proposal for course content". In 6th EAMT Workshop Teaching Machine Translation.
O'Brien, Sharon. 2006."Machine-translatability and post-editing effort: An empirical study using Translog and Choice Network Analysis" (Doctoral dissertation, Dublin City University).
O'Brien, Sharon. 2009."Eye tracking in translation process research: methodological challenges and solutions". In Methodology, Technology and Innovation in Translation Process Research.
O'Brien, Sharon, and Reinhard Schäler. 2010."Next generation translation and localization: Users are taking charge".
O'Brien, Sharon. 2011. "Towards predicting post-editing productivity. In Machine translation".
O'Brien, Sharon.2012. "Towards a Dynamic Quality Evaluation Model for Translation".
Offersgaard, Lene, et al. 2008."Domain specific MT in use." *Proceedings of the 12th EAMT conference*.
Oxford.2009. "Oxford English Dictionary. Oxford: Oxford University Press.
Pym, Anthony.2011."Translation research terms: A tentative glossary for moments of perplexity and dispute". Translation Research Projects 3, Tarragona: Intercultural Studies Group.
Pym, Anthony. "Translation Skill-sets in a Machine-translation." 16th Symposium on Interpreting and Translation Teaching. 2012.
Quah, Chiew Kin. 2006."Translation and technology". Palgrave Macmillan Hampshire: New York.
Sabtan, Yasser Muhammad Naguib.2020."Teaching Arabic Machine Translation to EFL Student Translators: A Case Study of Omani Translation Undergraduates." International Journal of English Linguistics.
Schäfer, Falko. 2003."MT post-editing: How to shed light on the" unknown task" Experices made at SAP." *Jt. Conf. 8th Int. Work. Eur. Assoc. Mach. Transl. 4th Control. Lang. Appl. Work*.
Shterionov, Dimitar, et al. 2020. "A roadmap to neural automatic post-editing: an empirical approach." *Machine Translation*. available at: https://www.researchgate.net/publication/344104493_A_roadmap_to_neural_automatic_post-editing_an_empirical_approach (web. 28th Nov. 2020).
Somers, Harold, ed. 2003. "Computers and translation: a translator's guide". Vol. 35. John Benjamins Publishing.
TAUS.Error.2013. "Typology Guidelines". (web. 15th May 2020).

https://www.taus.net/academy/best- practices/evaluate-best-practices/error-typology-guidelines.

TAUS.Machine.2017. "Translation Market Report", Available at: https://www.taus.net/think- tank/reports/translate-reports/taus-machine-translation-market-report-2017 (web. 15th May 2020).

TAUS. 2019."Post Editing / Reviewing Course". Online course. Available at https://elearning.taus.net/course/index.php (web. 1st Dec. 2019).

Vasconcellos, Muriel. 1986. "Functional considerations in the postediting of machine-translated output." Computers and translation.

Vasconcellos, Muriel. 1987. "A comparison of MT post-editing and traditional revision." *Proceedings of the 28th annual conference of the American Translators Association*. Medford, NJ: Learned Information.

Vieira, Lucas Nunes. Van Egdom, Gys-Walt. and Jakub Absolon. 2018. "Towards testing post-editing performance: a futureproof diagnostic." Tradumàtica.

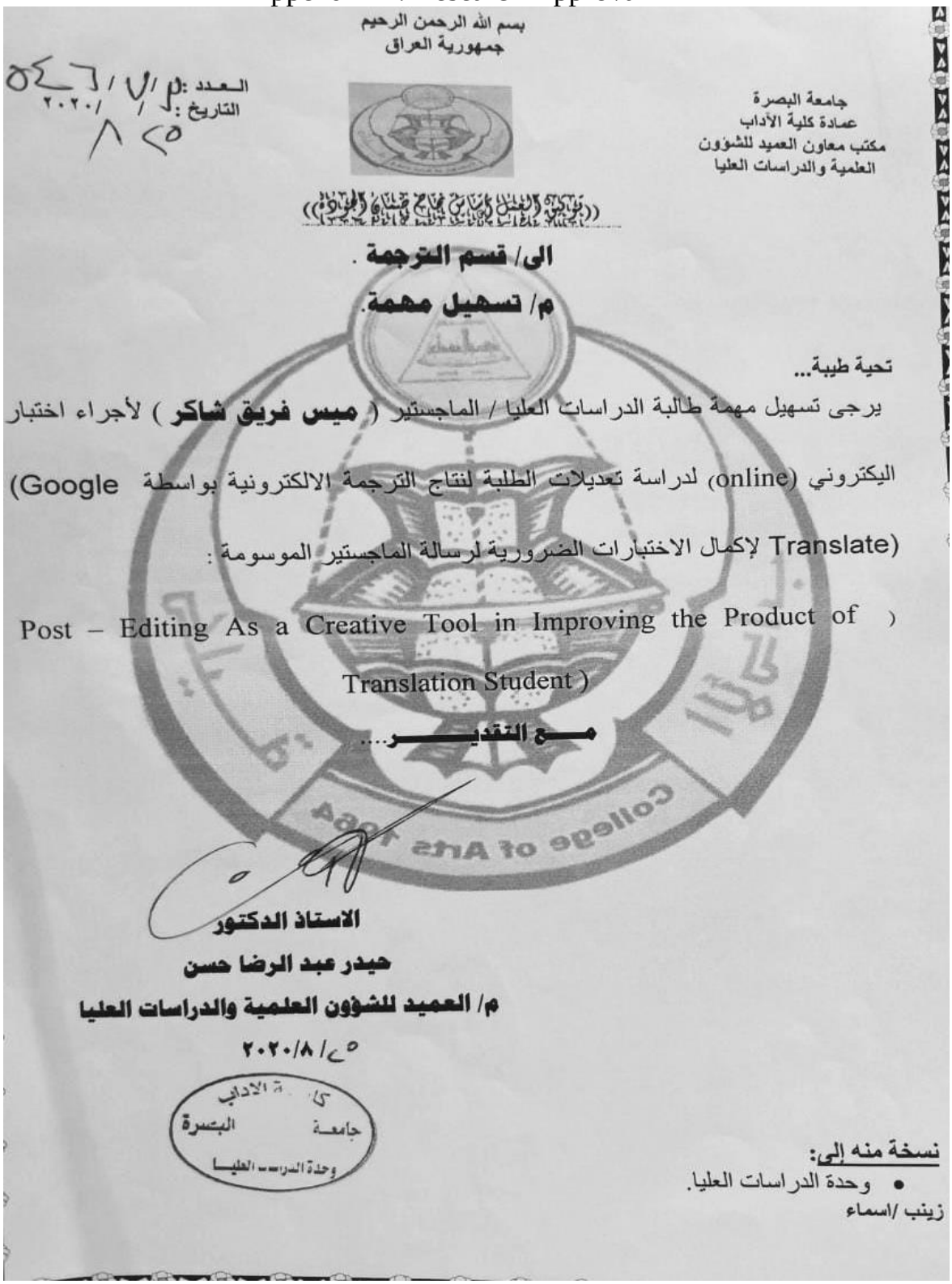
Wagner, Elizabeth. 1985. "Rapid post-editing of Systran." Tools for the Trade, Translating and the Computer.

Wu, Yonghui, et al. 2016."Google's neural machine translation system: Bridging the gap between human and machine translation".

Zhang, Jiajun, and Chengqing Zong.Dee. 2015. "neural networks in machine translation: An overview".

Zhang, Biao, Deyi Xiong, Jinsong Su, and Hong Duan. 2017. "A context-aware recurrent encoder for neural machine translation." IEEE/ACM Transactions on Audio, Speech, and Language Processing.

Appendix A: Research Approval



بسم الله الرحمن الرحيم
جمهورية العراق

العدد: م ا / ٥٤٦ / ٧
التاريخ: ٢٠٢٠/ ٨ / ٥

جامعة البصرة
عمادة كلية الآداب
مكتب معاون العميد للشؤون العلمية والدراسات العليا

((وقل اعملوا فسيرى الله عملكم ورسوله والمؤمنون))

الى/ قسم الترجمة .

م/ تسهيل مهمة.

تحية طيبة...

يرجى تسهيل مهمة طالبة الدراسات العليا / الماجستير (**ميس فريق شاكر**) لأجراء اختبار اليكتروني (online) لدراسة تعديلات الطلبة لنتاج الترجمة الالكترونية بواسطة (Google Translate) لإكمال الاختبارات الضرورية لرسالة الماجستير الموسومة :

(Post – Editing As a Creative Tool in Improving the Product of Translation Student)

مـــع التقديـــــــــر....

الاستاذ الدكتور
حيدر عبد الرضا حسن
م/ العميد للشؤون العلمية والدراسات العليا
٢٠٢٠/٨/ ٥

كلية الآداب
جامعة البصرة
وحدة الدراسات العليا

نسخة منه إلى:
- وحدة الدراسات العليا.

زينب /اسماء

Appendix B: Informed Consent

University of Basra

College of Arts/ Department of Translation

Dear Student

You are kindly requested to participate in the study entitled (Post-Editing as a Creative Tool in the Improving the Product of Translation Students). It aims to investigate the development of students' translation skills in post-editing machine translation and their correlation with a contribution to improve the quality of translation.

Please be ascertained that your participation will be confidentially treated.

Many thanks in advance

Researcher

Mays Fareeq Shakir

The procedures of the study

To investigate the improvement of the quality of student's translation in an electronic environment such as using online dictionaries, machine translations, or other CAT Tools, translation students will receive a pre-translated text by neural machine translation (Google translate) with its source text. Following this, the students will be asked to post-edit the pre-translated text. This task entails identifying major errors then correcting them to produce an acceptable version.

1. Your name* …….

2. E-mail* ……

3. Phone Number (optional)……..

4. Your current stage at Dept. of Translation * …….

☐1st

☐2nd

☐3rd

☐4th

5. Gender

☐Male

☐Female

6. Statement of consent *

☐I have read all above and I freely agree to enroll in this research test

Appendix C: Questionnaire

Please answer the following questions in the rank scale where the number
(1=Strongly disagree), (2=Disagree), (3=Cannot decide), (4=Agree), and (5=Strongly agree).

1. Are you familiar with Machine translation systems? *
☐1 ☐2 ☐3 ☐4 ☐5
2. During your study in the translation department, have you used Google translate in translating texts? *
☐1 ☐2 ☐3 ☐4 ☐5
3. Could you easily understand Google translate output? *
☐1 ☐2 ☐3 ☐4 ☐5
4. Do you practice post-editing machine translation output? *
☐1 ☐2 ☐3 ☐4 ☐5
5. As a novice translator, are you interested in post-editing? *
☐1 ☐2 ☐3 ☐4 ☐5
6. How often do you perform post-editing in your assignment activity? *
☐1 ☐2 ☐3 ☐4 ☐5
7. Specify the importance of the accompanying capacities to accomplish post-editing tasks.
حدد اهمية الفقرات الاتية في انجاز مهام تحرير النص المترجم آلياً.

- Knowledge of types of MT engines, their functional principles, and shortcomings. *
☐1 ☐2 ☐3 ☐4 ☐5
- Knowledge of typical MT errors *
☐1 ☐2 ☐3 ☐4 ☐5
- Ability to make decisions on whether MT output is editable *
☐1 ☐2 ☐3 ☐4 ☐5
- Ability to create “good-enough” output *
☐1 ☐2 ☐3 ☐4 ☐5

Other comments you may add.
……

THANK YOU FOR PARTICIPATING

Appendix E: Selected Text and MT output

Name:

SOURCE TEXT	MT output
GENERAL CONSIDERATIONS ON THE USE OF MASKS AND RESPIRATORS	اعتبارات عامة بشأن استخدام الأقنعة وأجهزة التنفس.
Like most respiratory viruses, SARS-CoV-2 (the virus that causes COVID-19) is principally spread by respiratory **droplets** produced when an infected person speaks, coughs or sneezes, and/or by **contact** via hands with a surface contaminated by virus-containing respiratory droplets, before touching the eyes, nose or mouth.	مثل معظم فيروسات الجهاز التنفسي، ينتشر SARS-CoV-2 (الفيروس المسبب لـ COVID-19) بشكل أساسي عن طريق الرذاذ التنفسي الذي ينتج عندما يتحدث الشخص المصاب أو يسعل أو يعطس و / أو عن طريق ملامسة اليدين مع سطح ملوث بالفيروس- تحتوي على قطرات تنفسية قبل لمس العينين أو الأنف أو الفم.
A mask can be used by a person with a respiratory viral infection, including COVID-19, **to protect others**, by decreasing the spread of droplets.	يمكن أن يستخدم الشخص المصاب بعدوى فيروسية في الجهاز التنفسي، بما في ذلك COVID-19، القناع لحماية الآخرين، عن طريق تقليل انتشار القطرات.
Masks (or, in selected circumstances, respirators) **and eye protection are used by health care workers** (and some other occupational groups) **to protect themselves**, when it is impracticable or inappropriate to maintain physical distancing from a person with a respiratory infection, including COVID-19.	. يستخدم العاملون في الرعاية الصحية (وبعض المجموعات المهنية الأخرى) الأقنعة (أو، في ظروف محددة، أجهزة التنفس) وحماية العين لحماية أنفسهم، عندما يكون من غير العملي أو غير المناسب الحفاظ على التباعد الجسدي عن الشخص المصاب بعدوى في الجهاز التنفسي، بما في ذلك COVID.

Appendix F: Jury Assessment sheet

Fluency: identifies weather the translation is well-formed, correct spelled, follows the common use of terms, and names.

Incomprehensible =1	Disfluent =2	Good =3	Flawless=4

Flawless	Refers to a perfect text with no errors.
Good	Refers to a smoothly text even with number of errors.
Disfluent	Refers to a text that is poorly written and cannot be understood.
Incomprehensible	Refers to a very poorly written text and impossible to understand.

Adequacy:

None =1	Little =2	Most =3	Everything=4

Adequacy: identifies the amount of meaning in the source text that expressed in the target text.

Everything	The meaning of the source is completely conveyed in the target.

Most	Almost all the meaning of the source can be located in the target.
Little	Fragments of the meaning of the source are found in the target.
None	None of the meaning of the source are conveyed

1.

ST	GENERAL CONSIDERATIONS ON THE USE OF MASKS AND RESPIRATORS
MT	اعتبارات عامة بشأن استخدام الأقنعة وأجهزة التنفس.

2.

ST	Like most respiratory viruses, SARS-CoV-2 (the virus that causes COVID-19) is principally spread by respiratory droplets.
MT	مثل معظم فيروسات الجهاز التنفسي، ينتشر SARS-CoV-2 الفيروس المسبب لـ (COVID-19 بشكل أساسي عن طريق الرذاذ التنفسي.

3.

ST	contact via hands with a surface contaminated by virus-containing respiratory droplets
MT	عن طريق ملامسة اليدين مع سطح ملوث بالفيروس- تحتوي على قطرات تنفسية.

4.

5.

ST	A mask can be used by a person with a respiratory viral infection, including COVID-19, to protect others, by decreasing the spread of droplets.
MT	يمكن أن يستخدم الشخص المصاب بعدوى فيروسية في الجهاز التنفسي، بما في ذلكCOVID-19 ، القناع لحماية الآخرين ، عن طريق تقليل انتشار القطرات.
ST	Masks (or, in selected circumstances, respirators) and eye protection are used by health care workers (and some other occupational groups) to protect themselves.
MT	يستخدم العاملون في الرعاية الصحية (وبعض المجموعات المهنية الأخرى) الأقنعة (أو، في ظروف محددة ، أجهزة التنفس) وحماية العين لحماية أنفسهم.

6.

ST	when it is impracticable or inappropriate to maintain physical distancing from a person with a respiratory infection, including COVID-19.
MT	عندما يكون من غير العملي أو غير المناسب الحفاظ على التباعد الجسدي عن الشخص المصاب بعدوى في الجهاز التنفسي، بما في ذلك COVID -19.

A F PEMT

[1] *Created at 5 Oct. 2020

[2] available at https://forms.gle/4Lw2Ky96Ek9rWqw56 , created on 11 Sep. 2020

[3] Lexico is website bowered by Oxford at https://www.lexico.com/definition/respirator accessed 9th Nov. 2020.

[4] https://dqf.taus.net/workbench/ (accessed 9th May 2020).