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EXPLORING COMPUTER SCIENCE STUDENTS' SKILL IN TRANSLATING TECHNOLOGY AND COMPUTER TERMINOLOGIES

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Abstract: This research explores the skill of computer-science students in translating technology and computer terminologies. It is a mixture of qualitative and quantitative. The data is collected by a survey. The participants are students of Amikom Purwokerto University. The analysis is executed using the Molina-Albir theory of translation techniques. It is then continued by evaluating the type of equivalency using theory from Kade. The result shows that the students' skill in translation varies. The techniques applied help the students to deliver the meaning from the source text to the target text. Unfortunately, only a half of the whole data reaches the total equivalence because of its changes

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in the form. Hence, the finding confirms that background knowledge of the participants in technology and computer science is provenly helpful to deliver and interpret the meaning. It also arisen an assumption that the combination of their knowledge and linguistics considerably can help the students in establishing the equivalency. Therefore, it is expected that the findings of the research give the novelty to the translation studies and also for the lecture in giving the lesson and activity for English and translation class because it is beneficial and gives contribution to solve the-real-world challenges.

Keywords: *skill, translation, terminology, computer, technology*

INTRODUCTION

In this digital era, as technologies are increasingly developed and upgraded, new terminologies in that field are increasingly created (Mudawe & Mudawe, 2019; Ray, 2017). The terms are created dominantly in the English language. It is unquestionable since English has become a global language (Sari, 2009) and the native of technology producers (Doherty, 2016). Meanwhile, the spread of technologies and the use of English terminologies causes a language mixture among the non-native users, like Indonesian (García, 2021; Kameneva, 2019). Seeing the phenomenon, translation can be conducted as one of the solutions to minimize the issue (Awang & Salman, 2017).

Translation flows dynamically to go along with the needs in various fields, like technology and computers. Translation of English terminologies into Arabic in that field has been initiatively conducted to maintain their language purity by domestication and naturalization (Awang & Salman, 2017; Hassan, 2017). The similar purpose is also brought to the translation of English terminology into Chinese (Zhu, 2020). Meanwhile, the translation of English terminologies into

Filipino was conducted in order to intellectualize the Filipino language and balance the hegemony of the English language in the Philippines education system (Ravina, 2022). It is interesting yet challenging (Febryanto et al., 2021; Saptaningsih, 2018). Translation is not only a practice in English class, it is also proposed to be applied in communication by people across nations (Tsvirkun, 2022). The equivalents must have a similar message as the original (Sianturi, 2013). It can be complicated because cultural differences construct the meaning among languages (Ho et al., 2019). In fact, the target language sometimes does not have an established equivalence of those terminologies (Christy, 2016; Nur, 2019). Hence, translating terminology needs a high level of knowledge and mastery in the relevant fields (Hosseinimanesh & Dastjerdi, 2013).

The importance of translation and the literature from theorists arouses a wonder to carry it on research. The translators are students of computer science. It could be a good chance for the student to take advantage of their studies about English especially in translation skill (Borodina et al., 2021). By utilizing their skill, students are also able to create a technical dictionary as developed nowadays (Handayani & Hiswara, 2019; Kruhlij & Chernyak, 2021). The significance gives them a picture of an example of the application of their theoretical knowledge into practical so that the students can make contributions to face the challenge in the real world.

Evaluation of students' translation skills is noteworthy. It will be beneficial to see, explore and assess their skill so that the weakest part can be strengthened (Sharififar & Rahimi, 2021). Nevertheless, only few studies pay attention to it (Ho et al., 2019). The present research tries to enrich the literature and elaborate it to fulfill the needs. The evaluation can be started from the points of equivalence as the concern of translation by seeing their techniques of translation (Kushlyk & Smienova, 2022). The properly chosen technique of translation could guarantee a successful communication but the non-equivalent vocabulary can be a serious challenge in communication (Bobrova et al., 2021).

Any kind of research in translation must involve the two or more texts that are called as source text and target text. Source text (ST) contains the original message that is delivered in one language. While the target text (TT) is seen as the translated text. It is the result of the process of delivering the similar message as in the source text into another language. Source and target text will be familiarly mentioned in the discussion as TT and ST. The process of translating the source text possibly makes changes in the message delivered in the target text. Hence, the evaluation of equivalence is needed.

Equivalency has become the center of translation studies (Luong, 2016). It refers to the condition of meaning wholeness that is transferred from the source text to target text (Yinhua, 2011). Making an evaluation of equivalency means acknowledging the factor that determines the closeness of target text to the source text. Hence, the translator should try his best to convey all of the content of the source text into the target text.

Based on the theory of expertise in translating terminologies and the chance to preserve the users' native language, the evaluation of translation skill from the viewpoints of examining the equivalency among the ST and TT is necessary. The evaluation of it can be based on the semantic and pragmatic approach (Vozna & Antonyuk, 2021). Both are branches of linguistics in the study of meaning, literally and contextually. It also can be supplemented by the syntactic approach to consider the equivalency (Hrushko, 2020).

Encouraging the students to find the equivalence can be a starting point to explore their skill in translation. The students' work then leads to the investigation of their skill translating terminology in the field of technology and computer. Thus, research can be conducted to make an evaluation and confirm the proposed theory of acquiring expertise of certain knowledge in translation.

Many pioneers might have executed the studies to evaluate the result of translation by reviewing the applied techniques of translation (Zamora, 2015). The analysis of abstract translation in the Faculty of Computer reveals that the equivalency is dominantly

reached in the level of above the word (Anjani et al., 2021). It is measured using the theory from Mona Baker. Other studies concerning the analysis of translation techniques utilize various theories. Using theory from Vinay and Darbelnet (Pickford et al., 1960), the translation of computer terms into Bahasa is noted to frequently use borrowing techniques. It is surprising since this kind of technique seems to be applied for popularizing the foreignization so that the purpose of translating English terminologies is discord not to localize the non-native terms (Mityagina & Volkova, 2019). Another analysis involves the theory from Molina and Albir (Albir & Hurtado, 2002) to analyze the translation techniques in procedure text of operating system manual books (Kustanti & Agoes, 2017). The analysis produces calque that becomes the most used technique. Another research concern on students' competence is also found out. It analyzes the translation competence of BA and MA students in different aspects, that is by translating without and with the help of a translation machine (Bobrova et al., 2021; Taghizadeh & Azizi, 2017).

This research might have similar concerns to half of its analysis and use similar theory of translation techniques that is using Molina and Albir (Albir & Hurtado, 2002). The difference lies in the focus and the viewpoints of the analysis, that is to the students' skill of translating English terminologies in the field of technology and computer related to their educational background. The findings not only about the techniques used but also the equivalency of the translated terms and the evaluation of the techniques in order to reach the equivalencies in the result of translation. Thus, the findings are expectedly beneficial for the students so that they can evaluate their imperfect work. Besides, it also can give benefit to the reader, especially anyone who is concerned and interested in translation studies as the literature of translation techniques in the field of technology and computer. The accomplishment of this present research also gives another experience in understanding the students' skills in translation. Besides, it can be used as an example to show the

students the advantages of learning English and its application to meet the challenges in real life.

METHOD

As the concern of the research analysis is to know EFL students' skill in translation, the participants are students in higher education. They study in Universitas Amikom Purwokerto majoring in computer science. The participants are in their fifth semester and take English class. Their involvement is in giving the translated terminology from English to Indonesian based on their knowledge and familiarity of certain terms. Thus, their work will be seen as the data of the research.

Survey in the form of a free answer will be an instrument that is applied in this research. It becomes a procedure to ask the participants some questions. The answer is unrestricted and unguided which means the students as participants can give any answer from the instruction delivered.

The participants firstly will be given an introduction to *Senarai Padanan Asing Indonesia (SPAI)* in order to give them an understanding and illustration about translation activities. SPAI (now become PASTI) is an application organized and developed by Badan Pengembangan dan Pembinaan Bahasa, Kementerian Pendidikan dan Kebudayaan Indonesia. The application contains the equivalence of English terminologies in Indonesian. It is utilized in this research to give the participants examples of the result of translated terms.

After seeing that the participants understand about the translation and the example of it, the survey is carried out. It is aimed to know the students' skill in translation by the delivered equivalent of English terminology in the field of technology. The participants are given an instruction of what they have to do. They are requested to make a list of English terminologies in the field of technology and computer. The terminologies that are meant to be listed are terminologies that are mentioned in English and they find it during their study in computer science but have not been listed in SPAI.

Then, they are asked to give the equivalence of it in Bahasa. After that, they submit their work by listing the terms and its equivalency in WhatsApp Group. The application is considered to be the simplest medium for participants to submit their work. After the submissions are finished, the researcher checks their works, rewrite and organize it into the table using Ms. Excel. Hence, the data was collected in the form of words and phrases.

Finishing the data collection directs into the next step, that is analysis, qualitatively and quantitatively. In this step, the theory of Molina and Albir (Albir & Hurtado, 2002) about translation techniques is used to classify the way the participants translate the terms. Molina and Albir proposed 16 techniques. They are adaptation, amplification, borrowing, calque, compensation, description, discursive creation, established equivalent, generalization, linguistic amplification, linguistic compression, literal translation, modulation, particularization, reduction, substitution, transposition and variation. The mount of each technique is also counted to see the dominant.

After the techniques, the analysis continues to the part of equivalency. It uses the theory of Kade (1968) as written in Pym about the type of equivalency and involves the theory of semantic and pragmatic to support the classification of the data into Kade's type of equivalency (Pym, 2017).

Table 1. Types of equivalence

<i>Types</i>	<i>Description</i>
Total Equivalence	One unit of language in a source language corresponds to one in target language
Choice-based equivalence	One unit of language in source language corresponds to several units in target language
Approximate equivalence	Only partial equivalents are available
No equivalence	No equivalent is available in target language

The next analysis concerns evaluating the factors that help to build the equivalency and the factors that hold it. Thus, accomplishing the analysis of the data makes the researcher get several findings and try to present it in a table and passages.

Therefore, the conclusion can answer the hypothesis and the objectives of the research.

FINDINGS

The participants of this research have given their role in part of data collection. From the submission of their work, there are 1639 terminologies that are collected as the data. The rest 190 terminologies are not taken as the data because of several considerations like the source text is not written in English and the target text has no meaning because of incomplete translation.

The analysis of translation techniques using the theory of Molina and Albir (Albir & Hurtado, 2002) gives the findings that not all of the techniques are found applied by the students to translate the English terminologies. The details are displayed as follows.

Table 2. Number and variety of translation techniques

<i>Translation Techniques</i>	<i>Amount of data (percentage)</i>
Borrowing	2.56
Calque	11.35
Description	18
Established Equivalent	3.36
Generalization	1.71
Linguistic Amplification	2.26
Linguistic Compression	1.1
Literal Translation	55.83
Modulation	0.49
Particularization	0.96
Total	100

As it is initially displayed on the table, the result of analysis shows that the number-one technique that is frequently applied in the data is literal translation. The students serve the terminologies in Bahasa that correspond to the meaning of English terminology for each word. The second is description. By this technique, the students do not give an equivalent for each word but gives the similar meaning by explaining the term using Bahasa. The other techniques ranging from the more to the least are calque, linguistics

amplification, established equivalent, borrowing, generalization, particularization and modulation. They tend to use those techniques because they do not really consider to produce the equal meaning in target text or they are not really sure about its equivalence.

The activity of translation refers to rendering the meaning and the style to reach the equivalency. Hence, the analysis of equivalency needs to be involved as the sequence of a research in the field of translation.

Table 3. Types of equivalencies

<i>Types of equivalency</i>	<i>Amount of data (percentage)</i>
Total Equivalence	52.3
Choice-Based Equivalence	33.36
Approximately Equivalence	12.12
No equivalence	1.98
Total	100

Based on the types of equivalencies given by Kade (Schäffner, 2003), the data of the research dominantly reach the types of total equivalence. The students as participants of this research are able to deliver the meaning into the target text that corresponds to the source text. Meanwhile, the second type that is reached by the translation is choice-based equivalence. The data that belongs to this equivalent is actually understandable and refers to the meaning delivered in source text. Yet, the translation does not produce a similar form as the source text. As a result, the translated terms become another alternative that can be delivered by the students in giving the equivalent. This is because there are still words in target language that can serve the similar meaning in similar form. The other equivalency is approximately equivalence. It is the category of equivalence when the translated term actually refers to the meaning in the source text but the result of translation does not deliver its meaning completely. It only covers partially, not as a whole meaning. There are only a few pieces of data that belong to no equivalence since the translation delivers different meanings.

DISCUSSION

The findings give the answer of hypothesis and the truth of literature. The result shown by the translated terms gives a picture of students' skill, especially in translating terminologies in the field of technology and computer. As mentioned in the previous session, the most applied technique is literal translation. This is not surprising because this technique is the most common and often used to translate any kind of text. The participants in this research do not realize to make any differentiation to the text type since their background knowledge is not based on linguistics. As a consequence, text type does not belong to the consideration while translating the text. Moreover, their English skill is dominantly categorized in the level of beginner to intermediate (Nida, 2021). Therefore, the easiest way to understand a passage is by translating it literally.

Related to the application of literal meaning in their translation of English terminology, the students' knowledge of the established terms in Indonesian language directly and automatically leads them to write it as the equivalency. It is dominantly seen in the data when the terms are formed in phrases consisting of two words and when they understand the core meaning of those terms. For example, "open source" is translated into Bahasa as "sumber terbuka". The term has already been established and well-known in the target language. Therefore, without any consideration, they write it as the equivalence of the English term.

Another case shows that their familiarity with English terms does not mean that they can translate it appropriately. For example, "data analyst" is familiar for the students but not for its equivalency in Bahasa. The students translate it into "menganalisis data". It means that the translation does not reach the equivalency. The mistakes might be avoided if the students understand about the class of words where the word "analyst" refers to the person, not the action. The translation using modulation is regarded less suitable for delivering the meaning since there is still a way to transfer the complete, whole meaning of source text.

Besides, the translation from "hardware" to "perangkat keras pada komputer" shows that the translation of the familiar terms can make the students a bit exaggerated. In this case, the additional words do not change the meaning. It explicates the hidden meaning. Meanwhile, the translation from "maintenance" into "pemeliharaan sistem" does not express the hidden but narrows the meaning. It only refers to the system. In fact, in computers, the word maintenance can also be used to fix the printer, not only the system or application.

In other data, the translation shows that the student does not lie on the familiarity but his knowledge and understanding. He translated "keylogger" into "perekam ketikan". Not all people in the world can understand that keylogger refers not to people but application. It means that the student understands the meaning of the term and delivers it by keeping the form, that is in phrase. Another student uses his knowledge to translate "hard brick". The result is "handphone hanya dapat menyala sampai logo splash dan terus berulang". He translated it by giving the definition. It might be true that hard brick refers to a certain condition. In fact, the change of form from the phrase to sentence makes them unable to reach the total equivalent. Similarly, the translation of "DDoS" into "serangan cyber" and "404" to "kode respon http". It might be true to explain the meaning of its term but the translation is not about defining or explaining the meaning of certain terms. It is about giving an equivalency for the closest both, form and meaning. This is the understanding that might not belong to their mind since they do not learn about the unit of language. Hence, the translation result shows that they have difficulties in providing the similar unit of language in the target text. It is interesting since the language of the target text is their native. It becomes a note to the proposed theory of knowledge mastery to translate terms.

The theory that talks about the needs of mastery and expertise of certain knowledge for translating the terms is rightly confirmed to be true. Students' knowledge in computer science helps them to understand the source text. It can be seen that they can define, explain

and give the detailed meaning about the terms that are written as source text. Confirmation of the existing theory is deliberately accepted. Students of non-linguistics studies might not think to ignore the consideration of language units, but they are not aware of it since they are not studying about it and it makes them not familiar with it. As a result, language units are not something that belongs to their consideration in translating the terms. It is understood yet becomes the obstacle of building the equivalency among the source and target text since translation activities concern finding the equivalence, both in the form and the meaning (Panou, 2013).

Other than focusing on their awareness of language units, the techniques that are dominantly used to translate the terms in this research have a similarity to the results of another conducted research for the dominant techniques of translation (Hadithya, 2014). Although the analysis uses a different theory, that is from Vinay and Darbelnet, the result refers to the similar techniques, that is giving the equivalence in target text by delivering the literal meaning of the source text. On the other hand, the technique of borrowing that is found rarely used in this research is seen as the dominant on the other research (Awang & Salman, 2017).

Concluding the statement above gives a lore that having knowledge of technology and computer science is not enough to give the proper equivalent by the meaning and the form. The students should also have knowledge of linguistics, at least about the unit of language. This is because the improper equivalent found in the data is caused by the change of language unit. Hence, the technique applied to find the equivalence should consider the purpose of translation, that is to maintain the delivery of similar meaning in similar units of language. Besides, the data also shows that the improper equivalence is caused by not maintaining the whole meaning of source text. The changes of language units sometimes can cause the equivalence to not have meaning as complete as the original version.

The interesting facts are discovered from the students' skill in translation. Knowledge of specialized scientific study is confirmed to

contribute to the student's skill in delivering the meaning (Kyvliuk, 2017). In this case, the concern to what can be improved is about the knowledge of linguistics studies, especially about the words that can be translated and the words that cannot be translated. Then, there is also a need to give the students an introduction about the class of words so that it can help them in maintaining the form of terminology and the delivered meaning.

The findings also lead to an introduction about what the student can learn by joining English class. That is not only about how to speak, read, write and listen, but also how to apply it so that they can contribute to the issues in the real world. This is interesting and can be repeated. Furthermore, the findings can be a consideration to the teacher or lecture in organizing the lesson material and exercise so that their objectives of the lesson can be factually applied to meet the needs (Umamaheshwari, 2017).

The better result of research in similar topics might be obtained when the researcher can give more detailed instruction while collecting the data from the participants so that they have basic knowledge of translation and language. The preparation for participants like giving them courses about linguistics or making a collaboration with the linguistics students is assumed to make it easier in getting the equivalence of translated terms.

CONCLUSION

The curiosity of students' skill in translation has been answered by the accomplished research. It still should be improved by giving them understanding about the unit of language since there are no problems with understanding the meaning of the source text since their background knowledge is in computer and science. This is important to be considered since translation, especially in the field of technology, is a continuous and time-limitless activity that brings a lot of benefits today and future. The students are expected to be aware of challenges that are faced today and future to maintain their native language. Hence, having and mastering the skill of translation

especially in the field of technology and computers becomes necessary. Therefore, the teacher, trainer or lecturer can consider it while arranging the material and exercise for English class so that what they learn can be applicable to face the challenge in the real world.

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