THE IMPACT OF TRANSLATION METHOD AND SHIFT ON TRANSLATION QUALITY AT BILINGUAL TEXTBOOKS OF PHYSICS, MATHEMATICS, AND HISTORY

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ABSTRACT

The first goal of the research was to figure out translation methods and shifts applied in translating bilingual textbooks of History, Mathematics, and Physics. Those bilingual textbooks were published by Quadra, Yramawidia, and Yudhisthira, used for grade seven in Medan. The second was to figure out the impact of translation methods and shifts which dominant on translation quality. The third was to recommend better bilingual textbooks to use based on the translation quality point of view. The research used a descriptive qualitative research method with a questionnaire, depth-interview, and observation on a pair of translation to collect the data. The data were analyzed with interactively and non-interactively. Based on the data analysis, the research finds that (1) the dominant shift on History textbook is unit shift while the dominant method is a free translation, the dominant shift on Physics is a unit shift and dominant method is a communicative translation, the dominant shift on Mathematics is structure shift and dominant method is communicative translation. The second finding is that the impact of the dominant translation shift and method on the History textbook is negative. At the same time, in Mathematics and Physics are positive. Third, the research; the researcher recommends bilingual textbooks of Mathematics and Physics to use based on translation quality point of view. The well bilingual textbooks can improve students’ language skills, while low translation quality influences bad development to students on learning the language.

Keywords: translation method, translation shift, translation quality, bilingual textbooks

INTRODUCTION

International schools use bilingual textbooks like Indonesia-English. Most international schools in Indonesia make bilingual textbooks as the main source in the teaching and learning process. Big cities in Indonesia, including Medan, exploit bilingual textbooks as a compulsory textbook to the students. Some years ago, the constitution assembly had stopped this program, such as international school and the usage of the bilingual textbook. However, several school policies consider to apply for such a program and to use a bilingual textbook for a certain reason. The school management perceives that reading bilingual textbooks can improve students’ skills in an international language. School management forgets that translators play a crucial role in translating bilingual textbooks, and also there is no quality control from the government. Hoed in Hidayat and Harmoko (2018) has stated that the translators have a responsibility for the written bilingual and international communication between the author and the readers. The responsibility can be realized by resulting in well-translated text. It means that the truth of original meaning needs to hold in the translation process. Furthermore, Suryawinata and Hariyanto in Mafulah et al. (2018) have said that translator should master the TL (Target Language) and SL (Source Language) language, SL and TL culture, a topic that should be translated, having competence in comprehending written language, having competence in writing (receptive skill), pour though and idea in the written form (productive skill), and having competence in using dictionary and references.

The translation method’s impact and shift on translation quality at bilingual textbooks of Physics, Mathematics, and History are conducted since the
researcher’s previous study (Sipayung, 2018). It is found that unit shift and free translation method influence the lack accuracy of translation level: 2,38, and there are 60% from the bilingual history textbook is lacks the accuracy of the translation (Sipayung, 2018). In this chance, the researcher investigates more translation quality aspects and more bilingual textbooks, such as Physics, Mathematics, and History, and applied inter-raters-reliability. Based on these previous findings, the researcher conducts further in-depth research to measure the impact of translation shift and method on bilingual textbooks of Physics, Mathematics, and History with inter-raters.  

These bilingual textbooks are used in grade seven. The quality of translation is something important that has to be investigated in the research. In this case, the quality of translation refers to three aspects: accuracy, acceptability, and readability. To measure each aspect, the researcher has modified indicators based on the recommendation of Nababan, Nuraeni, Sumardiono (2012). In addition to that, Nababan, Nuraeni, and Sumardiono (2012) have also formulated each aspect into a formula with the distinction of weight, like the accuracy aspect is three, acceptability is two, and readability is one. The next previous research is conducted by Ardi (2017), who investigates the impact of translation technique on the quality of translation on the social text. He finds that the translation quality is categorized well as the accuracy score is 3,33, acceptability 3,53, and readability 3,55 in the range of 1-4. Besides, Muchtar and Kembaren (2018) have also investigated translation technique and quality on nganting manuk text. They have stated that the translation quality is good enough; accuracy (70,4%), acceptability (63,4%), and readability (66,1%). Ayyad and Mahadi (2019) have stated that translators need to be bicultural in translating bilingual text. The next relevant research is done by Wang (2017) that has stated that translation quality assessment is categorized as ‘one size fits all’. He has also stated that gaps between theory and practice in translating could be narrowed down by increasing communication and cooperation between theorists and practitioners, who are advised to turn their focus to the translator’s competence and evaluation process. Hidayat and Harmoko (2018) have conducted similar research that focuses on translation method and procedure, while translation quality is not investigated.  

The importance of the research is a recommendation on better bilingual textbooks should be used and stopped based on the translation quality point of view. Among data sources (bilingual textbooks) are translated by the team include the authors. However, one source data (History bilingual textbook) is translated individually by the author only. In this case, the researcher predicts he/she lacks competence in translation and economic reasons. However, translation is an easy and cheap way to transfer knowledge.  

Based on the fact and gap of research, the problems of the research arises on the quality of translation. It is found in bilingual textbooks that are used by junior high school. Bilingual textbooks on the research as source data are History, Mathematics, and Physics published by Quadra, Yramawhidia, and Yudhisthira. It used by the seventh grade students in Medan.  

Similar research is also conducted by Yulianta, Nababan, & Djatmika (2018). Their focus is on translation acceptability and techniques. Nababan, Nababan, and Santosa (2019) have also conducted similar research with the same formula. However, their focus is on the impact of translation technique and their impact on Bible stories’ translation readability for children. The research does not only focus on translation acceptability and readability but also on translation accuracy. Romdhati, Nababan, and Santosa (2018) have examined translation techniques and translation shifts toward modality orientation, while the research focuses on translation level shift. Based on various previous research, as stated, it indicates that translation as a market of research. Nurlaila et al. (2018) have stated that there are 24.000 titles about translation, and it is important as a way to contribute theories and solutions, which make translators job easier.  

In Indonesia’s History, Ir. Soekarno has stated that “Bangsa yang besar adalah bangsa yang menghargai jasa-jasa para pahlawan”, and one more expression is “Jas merah, yang artinya – Jangan sekali-kali melupakan sejarah”. These statements are the great reasons for the researcher to choose History as a source data, while Mathematics and Physics as a subject involve in the national examination. History, Mathematics, and Physics are the compulsory subject for grade seven of junior high school. Quadra, Yramawhidia, and Yudisthira are the publishers that provide bilingual textbooks on History, Mathematics, and Physics.  

The following ST and TT are observed from History bilingual published by Yramawidia that is used by the seventh-grade students.

**ST:** Dikeluarkannya resolusi-resolusi dewan keamanan PBB  
**TT:** Issuance of some resolutions by the UN Security Council  

From the translation text above, the translators use the communicative translation method with some shift such as intra-system shift (resolusi-resolusi - resolutions), level shift (dikeluarkannya - issuance), and structure shift (dewan keamanan PBB - UN Security Council). Based on the translation method and shift influence on the translations’ quality, the informants’ role helps the writers rate the translation scale (in range 1-3) through questionnaires and in-depth interviews.  

By that issue, the researcher has a desire to research bilingual textbooks, namely Mathematics, Physics, and History published by Quadra, Yramawhidia, and Yudisthira, which are used by
Jhon has stopped smoking.

The Impact of Translation Method

translation, idiomatic translation, and communicative translation. This group is more emphasized to the target or target-oriented. When a translation is close to the target, it is called the ideology of domestication. The focus of the research is on the Newmark theory on the translation method. Newmark (1988) has stated that word-for-word translation is often demonstrated as interlinear translation, with the TL immediately below the SL words.

The SL word-order is preserved, and the words are translated. The literal translation is converted to their nearest TL equivalents, but the lexical words are again translated singly out of context. As a pre-translation process, this indicates the problems to be solved. Literal translation or form-based translation attempts to follow the form of the source language. A faithful translation attempts to reproduce the precise contextual meaning of the original text within the TL grammatical structures’ constraints. It transfers cultural words and preserves the degree of grammatical and lexical ‘abnormality’ (deviation from SL norms) in the translation. It attempts to be completely faithful to the intentions and the text-realization of the SL writer. Semantic translation differs from faithful translation only since it must take more account of the aesthetic value, that is, the beautiful and natural sounds of the SL text, compromising on meaning where appropriate so that no assonance, word-play, or repetition jars in the finished version. Adaptation is the freest form of translation. It is used mainly for plays, comedies, and poetry; the themes, characters, plots are usually preserved. The SL culture is converted to the TL culture, and the text rewritten. The deplorable practice of having a play or poem translated and then rewritten by an established dramatist or poet has produced many poor adaptations.

Free translation reproduces the matter without the manner or the content without the form of the original. Usually, it is a paraphrase much longer than the original, a so-called ‘intra-lingual’ translation, often prolix and pretentious. Idiomatic translation reproduces the message of the original text. However, it tends to distort nuances of meaning by preferring colloquialisms and idioms where these do not exist in the original. Communicative translation attempts to render the exact contextual meaning of the original in such a way that both content and language are readily acceptable and comprehensible to the readership.

Catford (1978) has stated that there are two kinds of shifts; shift of level and shift of category. The shift of level would be expressed by grammar in one language and lexis in another. For example:

ST: Jhon has stopped smoking.
TT: Jhon sudah berhenti merokok.

‘Has stopped’ in English’s grammar is a perfect tense, but in the translating process, it becomes a lexis ‘sudah’ in the Indonesian language. To support the Catford statement about translation shift, Rini (2015) has concluded that the translation shift is used to describe the changes that occurred between the source
text and target text. In addition to that, Wahyuni, Gurning, and Sinar (2015) have stated that shift should be redefined positively as the consequence of the translator’s effort to establish translation equivalence between two different language systems.

A category shift is given more. These are subdivided into four kinds. The first is the structural shift. These are said by Catford (1978) to be the most common form of the shift and to involve mostly a shift in grammatical structure. Second is the class shift. These comprise shift from one part of speech to another. Third, is a unit shift or rank shift. These are shifts where the translation equivalent in the TL is at a different rank to the SL. Rank here refers to the hierarchical linguistic units of a sentence, clause group, word, and morpheme. Furthermore, the last is the intra-system shift. This shift when the source language and the target language process approximately corresponding systems, but the translation involves selecting a non-corresponding term in the target language systems.

Translation’s quality is the outcome of a translation project. Good translation on the bilingual textbook can improve the knowledge of students on language through reading. However, bad translation influence the worst understanding of the target reader. In the research, the researcher uses the theory and the assessment of translation quality by Nababan Nuraeni, and Sumardiono (2012). A good or bad translation is measured by inter-raters-reliability. Some criteria of inter-rater which are recommended by them are considered in the research. Nababan, Nuraeni, and Sumardiono (2012) have described three translations of the quality rubric, such as accuracy, acceptability, and readability. Sofyan and Tarigan (2019) have stated that accuracy focuses on meaning transfer, which determines 50% of translation quality. Acceptability focuses on lexicogrammatical, which determining 33% of translation quality. The last aspect is readability, which focuses on language, determining 17% of translation quality. It is to indicate the major problem faced by translators in translating source text into the target.

METHODS

The research uses a qualitative descriptive method with an interactive and non-interactive technique to collect the data. The non-interactive technique involves a focus group of discussion or depth-interview and distributing the open and close questionnaire. The interactive technique includes observation on pairs of a translation text, which experience translation method and shift. In other words, it is called document analysis or noting document (read and write) on translation shift and method. After collecting the translation method and shift, the researcher condenses and displays data to conclude. This process is repeatedly conducted up to get enough data. This process is called an interactive analysis process. Based on Miles, Huberman, and Saldana (2014), it can be observed in Figure 1.

![Interactive Analysis Process](image)

There are three particular ways that are the researcher uses as a method to collect the data. They are analysis the data, questionnaire, and FGD of an in-depth interview. In the research, there are two kinds of data. First is objective data like document (bilingual textbook on History, Physics, and Mathematics) and affective data such as the score of translation’s quality from the questionnaire. The scores are received from inter-raters-reliability. The criteria of inter-raters-reliability are based on the recommendation of Nababan, Nuraeni, Sumardiono (2012). The updated formula (Nababan, Nuraeni, & Sumardiono, 2012) is used to measure translation quality. The document is the bilingual textbook on History, Mathematics, and Physics, published by three publishers such as Quadra, Yramawhidia, and Yudisthira that are used by grade seven in Medan.

Inter-raters-reliability of accuracy consists of three raters. They are a professional translation from Himpunan Penerjemah Indonesia (HPI), professional translation from Flitto, and the researcher himself. Three raters of physics are linguists, Indonesian lecturer who teach error analysis of Indonesia, and teacher of Physics. Three raters of Mathematics are linguists, Indonesian lecture who teach error analysis of Indonesia, and teacher of Mathematics. While three raters of History are linguists, Indonesian lecture who teach error analysis of Indonesia, and teacher of History. These raters (Physics, Mathematics, and History) are measured the acceptability of translation. To measure the readability aspect, three students of grade seven are asked to measure the target’s readability. These students are chosen since they are the user of the bilingual textbooks. The researcher uses a purposive sampling technique to analyze bilingual textbooks. In the research, the raters become a member of FGD.

RESULTS AND DISCUSSIONS

The research finding on the translation method can be described in Table 1. Based on the finding in Tabel 1, it can be seen that translators of History bilingual textbooks use free translation methods,

![Result and Discussion](image)
communicative translation, and semantic translation. Translators of History do not prefer to use the literal translation, adaptation, faithful translation, idiomatic translation, and word to word translation. The free translation method is the dominant method, 66.66%, that the translator uses. It is to indicate that translators tend to apply domestication ideology or emphasize the target text.

The translators of Physics use the free translation, adaptation, communicative translation, and faithful translation. Translators lack to apply literal translation, semantic translation, idiomatic translation, and word to word translation. In this chance, translators use the communicative translation method as a dominant method, 48.27% in translating Physics textbooks. It is to indicate translators emphasize on the target text.

The translators of Mathematics prefer to apply free translation methods, literal translation, adaptation, communicative translation, semantic translation, and faithful translation. Idiomatic translation and word to word translation do not apply by the translator. The dominant translation method that the translator applied is the communicative translation method, 53.44%. It is to indicate that the translator of Mathematics bilingual textbooks emphasizes target text.

The research findings on the translation shift can be seen in Table 2. It shows which translation shift is dominant and weak in each bilingual textbook. Table 2 shows the translation shift found in History, Physics, and Mathematics. All of the translators use applied whole translation category shift to solve the non-equivalence on the target text. The translators of History and Physics apply translation unit shift as the dominant shift: 58.33% for History, 66.66% for Physics. In comparison, translators of Mathematics applies structure shift as the dominant shift: 35.52%.

The translation quality of the textbook can be seen in Table 3. Based on the calculation in Table 3, the researcher has found that the History textbook is translated with a lack of accuracy. Most of the source meanings are translated accurately but can be found distortion of meaning, lack acceptable since translators’ mistaken in translating the technical term, incorrect grammar, and a moderate level of readability (clarity). The moderate level can occur because the rater does not have access to the source text. It means that the target reader needs to read more than once to get the meaning.

The translation of the Physics bilingual textbook is categorized accurately since no distortion of meaning based on the inter-raters. The translation is categorized as acceptable (natural) because the meaning of physics terms is translated based on the target norm. The translation has a high level of readability (clarity) since the target reader easy to get the meaning. While the translators of Mathematics are categorized as success in doing their activities, it can be seen from the target text’s inter-rater in Table 3. It has high accuracy, acceptability, and readability. Translators of Physics and Mathematics in the research have better competence then translators of History. Most of the meaning is deleting by the translator of the History textbook. Deleting meaning in translation is a reflection of the inability of translators.

Table 1 Frequency of Translation Method on Bilingual Textbook

<table>
<thead>
<tr>
<th>Textbook</th>
<th>FT</th>
<th>LT</th>
<th>A</th>
<th>CT</th>
<th>ST</th>
<th>Fh.T</th>
<th>IT</th>
<th>Ww.T</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS</td>
<td>38</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ph</td>
<td>15</td>
<td>0</td>
<td>4</td>
<td>28</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mt</td>
<td>16</td>
<td>3</td>
<td>3</td>
<td>31</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

HS : History  Ph : Physics  Mt : Mathematics
FT : Free translation  LT : Literal translation  A : Adaptation
CT : Communicative translation  ST : Semantic translation  Fh.T : Faithful translation
IT : Idiom translation  Ww.T : Word for word translation

Table 2 Frequency of Translation Shift on Bilingual Textbook

<table>
<thead>
<tr>
<th>Textbook</th>
<th>SS</th>
<th>CS</th>
<th>US</th>
<th>Is.S</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td>54</td>
<td>14</td>
<td>105</td>
<td>7</td>
</tr>
<tr>
<td>Physics</td>
<td>17</td>
<td>9</td>
<td>78</td>
<td>13</td>
</tr>
<tr>
<td>Mathematics</td>
<td>27</td>
<td>9</td>
<td>24</td>
<td>16</td>
</tr>
</tbody>
</table>

SS : Structure shift  CS : Class shift
US : Unit shift      Is.S : Intra system shift
Table 3 The Impact of Translation Shift and Method on Translation Quality on Bilingual Textbook

<table>
<thead>
<tr>
<th>TB</th>
<th>Accuracy</th>
<th>Acceptability</th>
<th>Readability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R1</td>
<td>R2</td>
<td>R3</td>
</tr>
<tr>
<td>HS</td>
<td>2.38</td>
<td>2.4</td>
<td>2.36</td>
</tr>
<tr>
<td>Ph</td>
<td>2.62</td>
<td>2.68</td>
<td>2.76</td>
</tr>
<tr>
<td>Mt</td>
<td>2.62</td>
<td>2.68</td>
<td>2.74</td>
</tr>
</tbody>
</table>

R1 : Rater 1  
R2 : Rater 2  
R3 : Rater 3

CONCLUSIONS

Based on the research findings and the analysis, the research concludes that the faithful translation method and unit shift produce a negative impact on translation quality. However, the communicative translation method and class shift produce a positive impact on translation quality. The dominant translation method and shift, applied by the translators, have a significant role in translation quality. As a contribution, translators need to be aware to choose the appropriate translation method and shift as a strategy to achieve the equivalence between ST and TT. As the implication of the research, the researcher offers Physics and Mathematics bilingual text as a well-translated textbook to read by the students to enrich their cognitive and psychomotor aspects. However, the investigation in the research is limited to the bilingual textbook (Physics, Mathematics, and History). The researcher is recommended to investigate factors that influence the negative and positive translation quality based on casual-comparative research.

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