Naturalization in Translation:A Case Study on the Translation of English-Indonesian Medical Terms

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Abstract
Naturalization is a translation procedure that is predominantly utilized in the translation of English medical terms into Indonesian. This study focuses on identifying types of naturalization involving the adjustment of spelling and pronunciation and investigating whether naturalization has been appropriately applied based on the rules in the Indonesian general guidance of term formation. The data were taken from the translation of selected articles of a medical textbook, General Ophthalmology (2008). The findings show that naturalization in English-Indonesian medical terms occurred in four categories, namely (1) adjustment of spelling with complex adjustment of pronunciation, (2) adjustment of spelling with simple adjustment of pronunciation, (3) adjustment of pronunciation without adjustment of spelling and (4) adjustment of spelling without adjustment of pronunciation. The products of naturalization have followed the guidance yet several new adjustment standards need to be included to enrich the pattern of foreign term adoption. In addition, this study recommends that types of 'absorption' in the Indonesian guidance of term formation needs to be revisited in order to precisely classify how foreign term's pronunciation and spelling adjustment is made in the Indonesian language.

Keywords: Naturalization, translation procedures, medical terms, adjustment of pronunciation, adjustment of spelling

Introduction

Translation procedures refer to the strategies applied by a translator in rendering the meaning from source language (SL) text to target language (TL) text. Procedures as proposed by Newmark (1988: 81) are the terms frequently used to refer to how linguistic units at micro level from sentences, clauses and the smaller units of linguistics like phrases and words are translated (Pavlušová 2014). The term micro level here is used to compare to macro level which is a whole text summarized from the other Newmark's term i.e. translation methods. The application of translation procedures involving two languages with different system and culture leads to various interesting phenomena. In Indonesian context, translation has been accepted as one of the triggering factors of language development that is realized through the use of several translation procedures. The translation of a huge number of foreign terms into Indonesian results in several classifications showing different types of naturalization.

Transference or pure borrowing is often irrefutable in many fields of study to purely transfer the concept of the foreign terms to Indonesian. The popular examples of transference or pure borrowing are the terms *internet* and *print* that are used in Indonesian without undergoing spelling and pronunciation adaptation. Naturalization or naturalized borrowing included in the chart of foreign term formation from the committee of the Indonesian language development (2006) shows that the 'absorption' of foreign language terms contributes to enhancement of vocabulary inventory as long as the process is applied in accordance with the rules determined in the Indonesian general guidance of term formation. The following examples represent how naturalization in Indonesian occurs based on the classification of the Indonesian language development committee. In presenting the examples and data, this paper uses the symbol "→" which signifies the translation of the terms in the target language. For example, *camera* → *kamera* means *camera* is translated into *kamera*.

(1) camera /ˈkæmərə/ → kamera /kamera/ (the adjustment of spelling and pronunciation)

(2) design /dɪˈzaɪn/ → desain /desain/ (the adjustment of spelling without adjustment of pronunciation. The example of this category needs to be reconsidered since adjustment of pronunciation still occurs despite the very slight sound differences between the term *design* and *desain*. This can be seen from the phonemic transcription of the two terms, i.e. /dɪˈzaɪn/ and /desain/)

(3) bias /baɪəs/ → bias /bias/ (the adjustment of pronunciation without adjustment of spelling)

Three types of naturalization included in the chart of foreign term formation indicate that a great number of Indonesian vocabulary derives from other languages. In Indonesian context, the words or phrases adopted from other countries can be commonly used and be part of people's daily life. Or, they may only be utilized in specific fields of study for instance the use of medical terms, legal terms, culture-bound terms and so forth. Based on the concept of naturalization, the borrowed terms undergo certain adjustment as shown in the three examples namely camera /ˈkæmərə/ → kamera /kamera/, design /dɪˈzaɪn/ → desain /desain/, and bias /baɪəs/ → bias /bias/. From linguistic perspective, the changes can be comprehensively reported based on phonology theories and the spelling adaptation is made in accordance with the writing system in one language. The transfer of "camera" /ˈkæmərə/ to "*kamera*" /kamera/ shows the changes in pronunciation and spelling. In other cases, adjustment can also occur only in the spelling of the terms while the pronunciation remains the same. The translation of "design" becomes "*desain*" is mentioned as the example of foreign term absorption that faces adjustment of spelling without adjustment of pronunciation. As clearly seen in the phonemic transcription of the two terms, i.e. /dɪˈzaɪn/ and /desain/ this study tries to further investigate through the cases in medical terms translation that, in fact, adjustment of pronunciation still takes place although the two terms are pronounced similarly. A new classification must be made if many other examples are found to experience the slight pronunciation adjustment. It can be done by differentiating whether the changes are complex or simple.

Naturalization as a translation procedure shows the adaptation of SL word to normal pronunciation, then to normal morphology of TL (Newmark 1988: 82). This means that naturalization focuses on the adaptation of form as the result of translation activity, which is automatically followed by the transfer of meaning. The adaptation of form may be realized in spelling and pronunciation adjustments that can be thoroughly observed by identifying the changes in both the orthographical and phonological systems. The adjustment of pronunciation is closely related to phonological translation showing the adjustment of sound segments from the SL term to the TL term. Naturalization involving the adjustment of pronunciation can be shown through the presentation of different phonemic transcriptions between the SL terms and TL

terms. Meanwhile, the spelling adjustment can be seen from how the terms are written in accordance with the spelling standards determined in the target language.

As a product of language contact, translation can contribute to enhancement of specific terms of certain discipline through some procedures such as borrowing (Vinay and Dalbernet in Venuti, 2000), transference and naturalization (Newmark 1988), as well as pure borrowing and naturalized borrowing (Molina and Albir 2002). This study explores how naturalization takes place in the translation of medical terms from English into Indonesia. Specifically, the investigation of naturalization in the translation of English-Indonesian medical terms is worth doing since there is a high tendency of borrowing either pure or naturalized so that the results of the present study can significantly contribute to describe how foreign terms are adopted into Indonesian. It is done through the identification of spelling and pronunciation adaptation taking place in medical translation. The discussion includes types of naturalization which show the classification of adjustment made in the process of naturalizing the English terms.

Literature Review

Several studies on the translation of medical terms from English into Indonesian had been conducted to map the translation procedures and determine unique phenomena that occurred in the translation of medical translation. The predominant results found in the medical translation from English into Indonesian involve two interesting phenomena, i.e. (1) borrowing in the form of transference and naturalization and (2) equivalence establishment to make the terms sound 'naturally Indonesian.' The former includes the process of naturalization in accordance with how the terms are commonly pronounced and written in Indonesian. The latter, equivalence establishment, indicates the adaptation of meaning that results in the creation of new terms that 'sound Indonesian.' It means that the terms do not undergo the adjustment of spelling and pronunciation yet the most appropriate equivalent is proposed after considering the concepts contained in the terms. Take for example, the term *biosecurity* used in the field of agriculture is not directly transfer to *biosekuriti* in Indonesian. Since the term primarily includes the concept of protecting humans or animals against disease through a set of preventive measures so that the risk of transmission of harmful disease can be reduced, the proposed term in Indonesian is *ketahanan hayati*. The term *ketahanan* is chosen to represent the concept of *security* which brings the idea of protection while the term *hayati* is the Indonesian word for *bio*. The term *ketahanan hayati* is created and then introduced to wider stakeholders in the field of biology and agriculture in Indonesia. Such a phenomenon is considered as the effort of establishing equivalence through the adaptation of concept.

Several researches conducted on the translation of medical terms from English into Indonesian confirm the results that borrowing either pure or naturalized is unavoidable. Praekananta (2007) found that there were two categories existed in English-Indonesian medical translation. The two categories were the translatable terms and untranslatable terms. The translatable terms were represented by *jantung* and *paru* to translate *cardiac* and *pulmonary* respectively that were not merely adopted to '*kardiak'* and '*pulmonari'* as how the adaptation of spelling system allowed. However, several medical terms were untranslatable. Such terms were borrowed and then adopted in accordance with the Indonesian spelling system. For example, the term *paroxysmal* was changed into *paroksimal*. Since a large number of terms in medical field contain very specific concepts that have been universally accepted in the world, the unstranslatability as proposed by Catford (1965) takes place.

In the case of English-Indonesian medical terminology translation, the adoption of terms is usually irrefutable. This phenomenon is triggered by the need of making the products of

translation universal. This means that the paramedics in Indonesia use the same terms in medical field with the paramedics in the other countries (Handayani 2009). Thus, classifying the types of medical terms is needed to predict which types of terms are often translatable or untranslatable. The classification can be made on the basis on several types namely medical treatment, diagnoses, body organs, diseases, and symptoms (Putri 2014).

In regard to the two studies posed above, the findings of the other research confirmed the tendency of literal translation application in the forms of pure and naturalized borrowing. Silalahi (2009) found that borrowing and naturalized borrowing took high percentage compared to the other translation procedures applied in the translation of 522 medical terms. The examples presented in this study were *ectropion* becomes *ectropion*, *vertigo* becomes *vertigo*, and *otosclerosis* becomes *otosclerosis* for pure borrowing and *cataracts* becomes *katarak*, *glaucoma* becomes *glaukoma*, and *miotics* is translated into *miotik* for naturalized borrowing (naturalization). Meanwhile, Widarwati (2015) introduced the taxonomy of translation procedures in the investigation on English-Indonesian medical translation showing similar phenomenon. In her finding, of 456 terms, 120 (26%) terms were translated through pure borrowing, for instance *pupil* becomes *pupil*, *miosis is* directly transferred to *miosis*, and *herpes* becomes *herpes*. Meanwhile, naturalization was applied to translate 153 (34%) terms that were represented by *diagnostic* is changed into *diagnosa*, *complication* becomes *komplikasi* and *cornea is* adapted into *kornea*.

The previous studies had yielded the mapping of translation procedures in which naturalization was one of the predominant strategies applied in translating the medical terms from English into Indonesian. Despite the mapping, the process of naturalization from the linguistic perspective had not been thoroughly examined. In case of English-Indonesian translation, naturalization was merely reported by demonstrating the English terms and their changing form in Indonesian. The previous investigation primarily focused on the variety and number of translation procedures without digging deeper to the interesting phenomena that can be found in the application of each procedure. It is this study that specifically attempts to reveal types of naturalization to demonstrate how the adoption takes place. Through the identification on English-Indonesian naturalization, the adaptation of form involving spelling or pronunciation adjustment can be clearly described.

Method

Materials

The investigation of this study focused on the objective aspect of translation studies. It means that the products of translation were used as the object of the study to reveal the questions dealing with naturalization taking place in the translation of medical terms from English into Indonesian. The research utilized unidirectional corpus (Olohan 2004: 24) which was only from one language to another language i.e., English-Indonesian, not vice versa. As the topic is to study the translation of English-Indonesian medical terms, unidirectional corpus referred to in this research is the use of six English selected articles and their translation in Indonesian found in a medical textbook.

The selected articles were taken from the medical textbook entitled *Vaughan & Asbury's General Ophthalmology* and its Indonesian translation, *Oftalmologi Umum*. The book was chosen as the data source since there were a lot of medical terms utilized in the book showing the results of naturalization from English into Indonesian. Six articles in the textbook were purposively chosen in consideration for different topic discussed in each article and the potency of finding

various data related to types of naturalization. Those selected articles for the further investigation were:
1) Anatomy & the Embriology of the Eye (*Anatomi & Embriologi Mata*)
2) Ophtamologic Examination (*Pemeriksaan Oftalmologik*)
3) Cornea (*Kornea*)
4) Genetic Aspects of Ocular Disorders (*Aspek Genetik Penyakit Mata*)
5) Low Vision (*Penglihatan Kurang*)
6) Blindness (*Kebutaan*)

Procedures

Data Collection Procedures

Data collection in this study included several steps starting from selecting the data source to analyzing how naturalization in Indonesian occurred. First, the selection of the articles in the text book, *General Ophthalmology* (2008), which covered different topics so that the articles containing several types of medical terms were purposively chosen to figure out the application of naturalization. Second, the identification of the collected data based on the adjustment of spelling and pronunciation from English into Indonesian. The sentences containing the English terms and their Indonesian translation were listed to identify the applied translation procedures. Third, the collected naturalized terms from the Indonesian texts were compared to their English equivalents in order to see the occurrence of spelling and pronunciation adjustments.

Data Analysis Procedures

This study applied qualitative method verified by quantitative data to support the analysis. Quantitative data were used to report the number of types of naturalization investigated in this study. It tried to reveal the interesting phenomena reflected in the products of translation so that the focus of this study was clear. The scientific steps in analyzing the collected data were taken to gain the objectives of the study namely to identify types of naturalization and to analyze whether or not the results of naturalization had been applied in accordance with the rules in Indonesian. The focus of the analysis was firstly on analyzing each type of naturalization through the comparison of phonemic transcription and checking the spelling of the collected terms. The English term's phonemic transcription was based on Collin's Dictionary of Medical Terms (2005) while the general guidance of term formation was used to be the reference in determining the naturalization process and its types. The classification was made in accordance with the analysis on the pronunciation and spelling differences between the English and Indonesian terms.

Data Analysis

The research was conducted with the aim of classifying types of naturalization taking place in the English-Indonesian medical terms translation and whether the naturalization process has been made in accordance with Indonesian general guidance of term formation. The pronunciation adjustment is described in accordance with the SL and TL syllable pattern changes. The observation on the pattern of syllable in this study is used to show the varieties of pronunciation adjustment occur. The description of the syllable pattern changes utilizes the shortened forms of vowels, i.e. V for vowel and C consonant. In this study, the comparison of the English and Indonesian phonemes which construct the syllable is done to demonstrate the process of naturalization.

After taking a number of steps including observing the translation procedures, this study found 109 data that could be used to observe the process of pronunciation and spelling adjustments in naturalization procedure. The following is the classification used to determine types of naturalization.

1.The data were classified based on the differences in spelling that are believed to have an effect on the pronunciation. In this way, the adjustment could be recognized more easily. It was done to closely observe the complexity of the adjustments. The next step was paying close attention to the pronunciation of the English and Indonesian terms that are considered undergoing particular changes. The pronunciation of English medical terms was thoroughly checked by utilizing the medical term dictionary guidelines (Collin, 2005) to investigate the phonemic transcription of the English medical term.

2. The pronunciation adjustments which are categorized as complex and simple are based on the number of sound changes that appear in both English and Indonesian terms when each phonemic transcription is compared. Examples of some terms presented in the first type of classification are, (1) cycloplegia [saikləʊ'pli: dʒə] becomes sikloplegia /sikloplegia/ and (2) cataract ['kætərækt] becomes katarak ['kætərækt] . The classification of naturalization patterns in several types can be shown by comparing the changes in the syllable pattern, the change from diphthong to one vowel and the addition and change of phonemes.

3. The adjustment of pronunciation and spelling cannot be avoided in the process of naturalization of the term from English to Indonesian because both languages have different writing and pronunciation systems. It is widely known that the pronunciation of the alphabet in English is not the same as it is written so that English, specifically, has a pronunciation dictionary. For example, the pronunciation of the vowel "a" in English pronounced [e], the vowel "e" becomes [ɪ]. Some consonants in their writing are two characters, but the phonemic transcription is represented by one phoneme, for example [tʃ] in the 'chip' counts as a phoneme which is represented by two characters, [t] and [ʃ] (Roach, 2007).

4. The standard for word formation which includes the phonemes of each term in English and Indonesian is not the same. In his description of the basic word formation standard in Indonesian (The Standard Forms of the Base Indonesian Words), Sinduwiryo (1992) mentioned that in general the words grouped as original words in Indonesian have two syllables with syllable patterns: V, VC, CV, CVC V is a vowel (vowel) and C is a consonant. It can be seen that the composition of syllables in Indonesian shows a combination of vowels and consonants. In English, syllable can be formed from the presence of consonant clusters which are indicated by the existence of two or consonants that appear sequentially referred to as clusters (Roach, 2007: 71). There are a number of consonants that can be combined with other consonants with lots of variations that tend to make it more difficult for the pronunciation method so that checking on the pronunciation method is needed. These are several factors driving the various types of naturalization processes in English to Indonesian.

Results

The phenomenon of naturalization in the Indonesian language cannot be separated from the Indonesian general guidance of term formation called PUPI (*Pedoman Umum Pembentukan Istilah*) as the important reference of the adoption of foreign terms in Indonesian. In PUPI, the translators can consult how the adjustment of spelling has to be made. The translators can also check whether or not they have made correct naturalization in the Indonesian spelling standard. This guidance is called Pedoman Umum Pembentukan Ejaan Bahasa Indonesia abbreviated PUEBI. For the specific discussion in the following sections, both PUPI and PUEBI are used to describe the adaptation of form consisting of spelling and pronunciation adjustments. The pronunciation of the terms in the data presentation was mainly taken from the Dictionary of English Medical Terms (Collin 2005). The adaptation of pronunciation can be seen from the phonemic transcription of each compared terms, namely the English and Indonesian terms.

In the translation of English-Indonesian medical terms, naturalization occurred in four categories, namely (1) adjustment of spelling with complex adjustment of pronunciation, (2) adjustment of spelling with simple adjustment of pronunciation, (3) adjustment of pronunciation without adjustment of spelling and (4) adjustment of spelling without adjustment of pronunciation. The first two types take almost the same percentage in the number of occurrence that is 45,9% for adjustment of spelling with complex adjustment of pronunciation and 49,5% for adjustment of spelling with simple adjustment of pronunciation. The other two types complete the classification as the variety of naturalization in the Indonesian language. They take the small percentage, i.e. 1,8% for adjustment of pronunciation without adjustment of spelling, and 2,8% for adjustment of spelling without adjustment of pronunciation. Table 1 below shows the finding concerning types of naturalization including their occurrence and percentage.

Table 1. *Types of Naturalization*

No	Types of Naturalization	Occurrence	Percentage (%)	Examples
1	Adjustment of spelling with complex adjustment of pronunciation	50	45,9	*mobility → mobilitas* *ophthalmoscopy → oftalmoskopi*
2	Adjustment of spelling with simple adjustment of pronunciation	54	49,5	*tonometry → tonometri* *diabetic → diabetik*
3	Adjustment of pronunciation without adjustment spelling	2	1,8	*iris → iris* *industrial → industrial*
4	Adjustment of spelling without adjustment of pronunciation	3	2,8	*simplex → simpleks*
	TOTAL	109	100	

The above data show that the occurrence of 109 naturalized terms in the selected articles, 50 terms (45.9%) are adjusted in both spelling and pronunciation systems. For example, the translation of the term *mobility → mobilitas* involving the complex adaptation of pronunciation from /məʊ'bılıtı/ to /mobilitas/. Meanwhile, naturalization that occurred through adjustment of spelling with simple adjustment of pronunciation was found in 54 terms (49.5%), for example *tonometry* /təʊnɒmətri/ → *tonometri* /tonometri/. The third type, i.e., naturalization through the adjustment of pronunciation without adjustment of spelling was applied only in 2 terms (1.8%). The transfer from *iris* /'aırıs/→ *iris* /iris/ showed that it is possible to see that naturalization in Indonesian takes place in the form of pronunciation adaptation yet no spelling adjustment is made. Lastly, the fourth type is adjustment of spelling without adjustment of pronunciation represented by the transfer of *simplex* to *simpleks*. This type involved 3 terms with the percentage of 2,8%.

Table 1 presents types of naturalization that occur in the translation of English medical terms into Indonesian. The four types of naturalization are briefly reviewed below with further explanation in the discussion section:

1. The adjustment of spelling with complex adjustment of pronunciation

The first type in the process of naturalization is the adjustment that takes place through the adjustment of spelling with complex adjustment of pronunciation. Complex adjustment of

pronunciation means that the changes involve adjustment of more than one vowel, vowel and consonant and syllable component. The description of pronunciation and changes is made by comparing the source language and target language terms so that the naturalization process is clear. For example, the naturalization from *cycloplegia* /saɪkləʊ'pliːdʒə/ to *sikloplegia* /sikloplegia/ includes adjustment of spelling and pronunciation. The English term is constructed by four syllables namely /saɪ/, /kləʊ/, /pliː/, dʒə/ which are translated into the Indonesian term having the same number of syllables namely /si/,/klo/, /ple/,/gia/ but they have different phonemes in each of the syllable. In terms of pronunciation, *cycloplegia* /saikləʊ'pliːdʒə/ is adapted due to the different phoneme inventories in in Indonesian.

2. The adjustment of spelling with simple adjustment of pronunciation

The second type of adjustment that is considered as simple changes shows the pronunciation of the term in English is not significantly different from the term in Indonesian. The adjustment is not as complex as the examples found in the first type. This is why the adjustment of pronunciation is called simple. For example, the term *diabetic* is translated into *diabetik*. The translation of *diabetic* /daɪə'betɪk / to *diabetik* /diabetik/ demonstrates simple adaptation of spelling and pronunciation. The naturalization can be seen from how the two terms are pronounced. Here, the difference can be seen from the replacement of diphthong /aɪ/ in English with /i/ and /a/ in Indonesian. The Indonesian term follows the pattern of Indonesian syllable so that, the term *diabetik* is identified as a four-syllable word with the construction CV in/di/, V in /a/, CV/be/, CVC in/tik/. This pattern is different from the English term that consists of three syllables namely /daɪə/,/be/ and/tɪk /.

3. The adjustment of pronunciation without adjustment of spelling

Naturalization of the English medical terms into Indonesian also takes place by means of the adjustment of pronunciation without adjustment of spelling. Such a process can be seen in the naturalization of the *bias* /baɪəs/ becomes *bias* /bias/ This example is taken from the committee of the Indonesian language development that shows the possibility of finding naturalization in Indonesian through the adaptation of pronunciation without adaptation of spelling. Although only a few data were found, this study proved that such naturalization occurred in the translation of English-Indonesian medical terms. Two data found were given as the examples of adjustment of pronunciation without adjustment of spelling, namely are iris /'aɪrɪs/→ iris /iris/ and industrial /ˌin' dʌstriəl/→ industrial /industrial/. As can be seen from the spelling, the English and Indonesian terms have the same letters to represent the meaning of the terms. However the phonemes that construct the terms the pronunciation are iris /'aɪrɪs/→ iris /iris/ and industrial /ˌin' dʌstriəl/→ industrial /industrial/ different. For instance, the term *iris*, that is pronounced /'aɪrɪs/ in English has two syllables that is the diphthong /aɪ/with the pattern V and the second syllable consists of with the pattern CVC as found in /rɪs/. Here, the English diphthong /aɪ/ is adjusted into /i/ as how the term is usually pronounced in Indonesian in accordance with its spelling.

4. The adjustment of spelling without adjustment of pronunciation

The last type of naturalization is adjustment of spelling without adjustment of pronunciation. In this type, the pronunciation is the same yet the spelling of the English and Indonesian terms are different. The example of this classification is the English and Indonesian terms *simplex* /'sɪmpleks/ and *simpleks* /simpleks/. As can be seen from the two terms' phonemic

transcription, it is clear that the adaption from *simplex* /'simpleks/ to *simpleks* /simpleks/ does not undergo the adaptation of pronunciation.

Discussion

In the translation of English-Indonesian medical terms, naturalization occurred in four categories, namely (1) adjustment of spelling with complex adjustment of pronunciation, (2) adjustment of spelling with simple adjustment of pronunciation, (3) adjustment of pronunciation without adjustment of spelling and (4) adjustment of spelling without adjustment of pronunciation.

The first type of naturalization taking place in the translation of English medical terms into Indonesian is adjustment of spelling with complex adjustment of pronunciation as represented by several examples below. The discussion on naturalization of each term is described in accordance with how the adjustment occurs. The term 'complex' is proposed to demonstrate that the changes include the adjustment of more than one vowel, vowel and consonant and syllable component. The description also focuses on presenting the spelling changes that take place as part of the naturalization process. The discussion of each datum is clarified with the support of some examples obtained from PUPI and PUEBI to reinforce the application of naturalization in terms of spelling adjustments.

The analysis of pronunciation adjustment is presented informally through a description on the SL and TL syllable patterns. By observing the pattern of syllable this study is expected to give contribution on demonstrating the varieties of pronunciation adjustment taking place in the translation of English-Indonesian medical terms. When describing the pattern of syllable, the shortened forms of vowels and consonants namely V and C are respectively used. The English and Indonesian phonemes that construct the syllable of the terms are compared in order to give a clear description on the changes made in the process of naturalization.

Table 2. *Naturalization Taking Place through the Adjustment of Spelling with Complex Adjustment of Pronunciation*

No	Spelling		Pronunciation	
	English	Indonesian	English	Indonesian
1	cycloplegia	*siklopegia*	/saɪkləʊ'pliːdʒə/	/siklopegia/
2	cataract	*katarak*	/'kætərækt/	/katarak/
3	erythromycin	*eritromisin*	/ɪrɪ θrə'maɪsɪn/	/eritromisin/
4	excitatory	*eksitatorik*	/ɪk'saɪtəri/	/eksitatorik/
5	neutrophils.	*neutrofil.*	/njuːtrəfil/	/neutrofil/

The results of spelling and pronunciation adjustments show how naturalization occurs in accordance with the Indonesian language rules and standards. The following is the presentation of representative data.

(1) cycloplegia → siklоplegia

The naturalization from *cycloplegia* /saɪkləʊ'pliːdʒə/ to *siklоplegia* /siklоplegia/ shows adjustment of spelling and pronunciation. The English term consists of four syllables namely /saɪ/, /kləʊ/, /pliː/, dʒə/ which are translated into the Indonesian term having the same number of syllables namely /si/,/klo/, /ple/,/gia/. In terms of pronunciation, *cycloplegia* /saikləʊ'pliːdʒə/ is

adapted due to the different phoneme inventories in Indonesian. The difference is on the replacement and addition e.g., in the first syllable of the English term that consists of consonant and vowel (CV) namely consonant /s/ and diphthong /aɪ/ in SL is replaced with vowel /i/ in Indonesian. In addition, the English term second syllable consisting of a consonant cluster and a diphthong as found in /kləʊ/ with the pattern CCV is replaced with /klo/, and a consonant represented by two characters /dʒ/ as well as the vowel /ə/ are respectively replaced by /g/ and /ia/. In terms of spelling the changes are already according to PUEBI; *–y* that is pronounced /i/ in Indonesian must be written "i" so that the term *cycloplegia* becomes *sikloplegia*.

(2) cataract → katarak

The term *cataract* /'kætərækt/ consists of three syllables with the patterns CV in /'kæ/,CV in/tə/, and CVCC/rækt/. The Indonesian term *katarak* has the same number of syllable with different patterns namely CV in /ka/,CV in/ta/, and CVC in /rak/. The difference indicates that the pattern of cognate Indonesian word is applied at the final syllable in which no consonant cluster is found. It can be seen from the adjustment of the syllable pattern in CVCC in/rækt/ to CVC/rak/. The pronunciation and spelling adjustments of the term *cataract* /'kætərækt/ show simpler changes compared to that of *cycloplegia → sikloplegia*. The change from /'kætərækt/ to /katarak/ demonstrates adaptations from the vowel /æ/and /ə/ that become /a/ and from a consonant cluster /kt/ to /k/. In terms of spelling, the change is clearly seen from the use of only one consonant k in TL. These changes are in line with the rules in PUPI and PUEBI about adaptation of spelling and pronunciation.

(3) erythromycin → eritromisin

Different pronunciation between *erythromycin* /ɪrɪ θrə'maɪsɪn/ and *eritromisin* /eritromisin/ shows pronunciation adaptation in naturalization process of the SL term into the TL. The changes can be seen from different phonemes in the syllable of the English and Indonesian terms. The changes in pronunciation can be observed from the compared terms namely (1) from the vowel /ɪ/ to /e/ in the initial syllable consisting of only vowel (V) in both SL and TL terms and (2) the English diphthong /ai/ in the third syllable of the SL term with the syllable pattern CV as found in /maɪ/ is changed into to /i/ in the TL term. Meanwhile, adjustment of spelling is found from "y" to "i" and from "c", which is pronounced /s/ in Indonesian, to "s." This adaptation shows the pronunciation and spelling adjustments which are done according to Indonesian systems of the term formation.

(4) excitatory→ eksitatorik

The term *excitatory*, which relates to the English verb *excite*, is an adjective that is often used to express an action that stimulates nerve or muscle. The meaning of the adjective *excitatory* is "tending to excite". It is pronounced /ɪk'saɪtəri/ which is different from /eksitatorik/ as the pronunciation of the TL term *eksitatorik*. The difference is seen from the initial vowel /ɪ/ in the first syllable consisting of VC as found in /ɪk/ that is replaced by /e/ in Indonesian and the English diphthong in the third syllable, i.e, /ai/ is replaced by /i/. At the final pronunciation an additional phoneme /k/ is seen in the TL word. The most significant difference in the pronunciation of the SL and TL is the number of syllable and its pattern. In SL term, the four syllables consists of VC as found in /ɪk/ , CV as seen in the consonant followed by the diphthong /saɪ/ and CV as used in /tə/ and /ri/. The Indonesian term has different construction in the pattern of the syllable namely VC as found in /ek/, CV as seen /sɪ/ and /ta/ and /to/and CVC at the final position as seen in /rik/. Regarding the spelling changes from *excitatory* to *eksitatorik*, there have

not been rules found in PUPI and PUEBI . There are some other similar cases for which new rules must be made in PUPI and PUEBI so that they can be used as references.

(5) neutrophils → neutrofil

The spelling change from *neutrophil* to *neutrophil* is seen from the change from "ph" to "f", which follows the rules in PUPI and PUEBI. The pronunciation change also occurs in that the SL *neutrophil* /nju:trəfil/ is adapted to the SL *neutrofil* /neutrofil/. In this example, it is found that the vowels and consonants that construct phonemic transcription of each term are not exactly the same so adaptation of pronunciation is necessary. Both SL and TL terms consist of three syllables with different phonemes. The English term contains /nju:/with the pattern CCV, /trə/ with the pattern CCV and CVC as seen in /fil/ and the Indonesian term shows the same number of syllable but the phonemes are changed, i.e. CVV in/neu/, CCV in /tro/ and CVC in /fil/ at the final syllable. The most obvious changes could be seen in the sound /nj/ that is pronounced /n/, the sound /u:/ that is pronounced /eu/ and the sound /ə/ that is pronounced /o/. It is clearly seen, then, that this particular translation applies adaptation of pronunciation and spelling.

The adjustment of spelling with simple adjustment of pronunciation is the second type of naturalization in Indonesian, for example the term design /dɪˈzaɪn/ → desain /desain/. This example is taken from the chart of foreign term adoption proposed by the committee of the Indonesian language development. The classification is made considering the pronunciation of the term in English is not significantly different from the term in Indonesian. The changes are not as complex as the examples classified in the first type. Thus, the adjustment of pronunciation is called simple.

This study identifies different classification from the division proposed by the committee of the Indonesian language development that classifies the changes from the term *design* to *desain* as only adaptation of spelling. Observing from the phonemic transcription, i.e. /dɪˈzaɪn/→ /desain/, it is obvious to see the difference, which shows the distinctive characteristic of the English and Indonesian terms. Based on this phenomenon, this study suggests that the adjustment must be admitted despite the occurrence of simple pronunciation adaptation.

Having investigated the applied naturalization procedure, this study classified 54 terms as the adopted terms that are made through adaptation of spelling with simple pronunciation adjustment. The examples are discussed based on how the adjustment takes place. The explanation covers the presentation on the spelling changes taking place in the naturalization process. Similar to the examples of type 1 posed above, each data is also discussed in accordance with PUPI and PUEBI as the standards of applying naturalization in the Indonesian language.

Table 3. *Naturalization Taking Place through the Adjustment of Spelling with Simple Adjustment of Pronunciation*

No	Spelling		Pronunciation	
	English	Indonesian	English	Indonesian
1	diabetic	*Diabetik*	/daɪəˈbetɪk/	/diabetik/
2	tetracycline	*tetrasiklin*	/tetrəsaɪkli:n/	/tetrasiklin/
3	tonometry	*tonometri*	/təʊnɒmətri/	/tonometri/
4	vascular	*vaskular*	/væskjʊlə/	/vaskular/
5	binocular	*binokular*	/bɪˈnɒkjʊlə/	/binokular/

(1) diabetic →diabetik

The translation of *diabetic* /daɪə'betɪk / to *diabetik* /diabetik/ shows simple adaptation of spelling and pronunciation. From their pronunciation, the difference can be seen from replacement of diphthong /aɪ/ in English with /i/ and /a/ in Indonesian. Following the pattern of Indonesian syllable, the term *diabetik* can be classified as a four-syllable word with the construction CV in/di/, V in /a/, CV/be/, CVC in/tik/. This pattern is different from the English term that consists of three syllables namely /daɪə/,/be/ and/tɪk /. Such an adjustment may not even be recognized if no close observation on the phonemic transcriptions of each term is made. In terms of spelling the change is already in accordance with PUEBI; –c that is pronounced /k/ in Indonesian is written as it is pronounced.

(2)tetracycline → tetrasiklin

The translation of *tetracycline* into *tetrasiklin* is considered the example of naturalized borrowing taking place through simple adaptation of pronunciation and adaptation of spelling based on the rules in the Indonesian language. The adaptation from *tetracycline* /tetrəsaɪkli:n/ to tetrasiklin /tetrasiklin/ demonstrates simple adjustment of spelling in which only vowels are adapted. From the phonemic transcriptions of each term, it is found that vowel /ə/ and diphthong /aɪ/ in the syllables /rə/ and /saɪ/ with the pattern CV in /tetrəsaɪkli:n/ are respectively replaced with /a/ in the second and third syllable of the TL term with the same pattern CV, i.e. /ra/ and /si/ in /tetrasiklin/. Meanwhile, from the spelling of the two terms, the changes are already according to PUEBI; "c" that is pronounced /s/ and "y" that is pronounced /i/ in Indonesian.

(3) tonometry → tonometri

Another example of simple pronunciation adjustment can be obviously seen from the transfer of tonometry/təʊnɒmətri/→ tonometri /tonometri/. The naturalization of *tonometry* to *tonometri* shows simple adaptation of pronunciation and is also followed by the adjustment of spelling. The pattern and number of syllable between the SL and TL terms are the same. This can seen in the English syllables with their patterns CV /təʊ/,CV/nɒ/,CVC/mət/ and CV/ri/and in the Indonesian syllables CV/to/, CV/no/, CVC/met/, and CV/ri/. In terms of pronunciation, the English term tonometry/təʊnɒmətri/ is simply adapted to Indonesian through the changes of English diphthong and vowel that is /əʊ/ and /ə/ in SL are replaced with /o/ and /e/ in TL. In terms of spelling the change is made in line with the rule in PUEBI; –y that is pronounced /i/ in Indonesian is presented with "i" in its spelling so that the term *tonometry* becomes *tonometri*.

(4) vascular→ vaskular

The adaptation from vascular /væskjʊlə/ to vaskular / vaskular / shows simple pronunciation adaptation. The SL and TL terms consist of the same number of syllable but different phonemes in each of the syllable namely CVC in/væs/, CCV in/kjʊ/ and CV in/lə/ in CVC in /vas/, CV in/ku/ and CV in/lə/ in SL. In terms of pronunciation, vascular /væskjʊlə/ is adapted through replacement and addition e.g., vowel /æ/ in English is replaced with /a/ in Indonesian, /ʊ/ with /u/, and consonant cluster /kj/ is only pronounced with /k/. In terms of spelling the adjustment has been made in accordance with PUEBI in which "c" is replaced by "k" following how the term is pronounced in Indonesian so that the term *vascular* becomes *vaskular*.

(5) binocular→binokular

Similar to the adaptation from vascular /væskjʊlə/ to vaskular /vaskular/, the naturalization of *binocular* /bɪ'nɒkjʊlə/ → *binokular* /binokular/shows simple adaptation of

pronunciation and adaptation of spelling. The number of syllable of both SL and TL terms are the same yet the phonemes containing the syllable of the terms are different. It can be seen from the SL term syllable pattern CV in/bɪ/ and /nɒ/,CCV in/kjʊ̈/, and CV in/lə/ compared to the TL term that is CV in/bɪ/ and /no/,CV in/ku/, and CVC in/lar/. Simple pronunciation differences between /bɪ'nɒkjʊ̈lə/ and /binokular/ are shown from the use of vowels in the two terms namely /ɒ/ compared to /o/, /ʊ̈/ compared to /u/ and /ə/compared to /a/, which is followed by trill sound /r/. Meanwhile, the spelling adjustment has followed the rules in PUEBI in which "c" is replaced by "k" following how the term is pronounced in Indonesian so that the term *binocular* becomes *binokular*.

The third type of naturalization in Indonesian occurred through the adjustment of pronunciation without adjustment of spelling. The naturalization of *bias* /baɪəs/ → *bias* /bias/ taken from the committee of the Indonesian language development represents the example that it is possible to find that naturalization in Indonesian also occurs through the adaptation of pronunciation without adaptation of spelling. This type completes the other three types that show how foreign terms are adopted in Indonesian. In a wider perspective, the findings indicated the impacts of language contact in the form of translation activity. That is, translation activity can be utilized to observe the variants of naturalized borrowing.

Table 4. *Naturalization Taking Place through the Adjustment of Pronunciation without Adjustment of Spelling*

No	Spelling		Pronunciation	
	English	Indonesian	English	Indonesian
1	iris	*iris*	/'aɪrɪs/	/iris/
2	industrial	*industrial*	/ˌin'_dʌstriəl/	/industrial/

Despite its small number, this study proved that such naturalization also takes place in the translation of English-Indonesian medical terms. The two data found as the examples of adjustment of pronunciation without adjustment of spelling are iris /'aɪrɪs/→ iris /iris/ and industrial /ˌin' dʌstriəl/→ industrial /industrial/. Detailed discussion on the adjustment is respectively presented to describe how naturalization of this type occurs.

(1) iris → iris

The term *iris* /'aɪrɪs/ is one of the eyes vital organs that is defined as "a coloured ring in the eye with the pupil at its centre" (Collin 2005). In Indonesian, the term is pronounced differently despite the fact that the spelling of the terms in English and Indonesian are the same. The term *iris*, that is pronounced /'aɪrɪs/ in English consists of two syllables namely the diphthong /aɪ/with the pattern V and the second syllable with the pattern CVC as found in /rɪs/. The English diphthong /aɪ/ is adapted into /i/ as how the term is usually pronounced in Indonesian in accordance with its spelling. Since there is no change in spelling, the transfer of *iris* /'aɪrɪs/ to *iris* /iris/ can be classified into naturalization that has the same case with the example given previously, i.e. *bias* /baɪəs/ → *bias* /bias/. Hence, the two terms are naturalized through the adjustment of pronunciation without the adjustment of spelling.

(2) industrial →industrial

The term *industrial* is often used to modify the term *disease*, e.g. industrial disease, which means "a disease which is caused by the type of work done by a worker or by the conditions in

which he or she works, e.g. by dust produced or chemicals used in the factory" (Collin 2005). The translation of the English term *industrial* /ˌin' dʌstriəl/ into *industrial* /industrial/ in Indonesian is not pure borrowing because the spelling is the same yet the pronunciation is different. Similar to the translation of *iris* /'aırıs/into *iris* /iris/, the adaptation only takes place in the form of pronunciation adjustment. The pronunciation is especially different in terms of vowel utilization, that is vowel /ʌ/ in the second syllable of the English term /*industrial*/ˌin' dʌstriəl/with the pattern CVC as found in /dʌs/ and the vowel /u/ in the Indonesian term *industrial* /industrial/.

The fourth type of naturalization found in this study is adjustment of spelling without adjustment of pronunciation. Three terms in English and their translation in Indonesian were found as the representative data of this adjustment. The example of the fourth type shown in table 5 is also presented through the same discussion demonstrating how the adjustment occurs. The translation of *simplex* /'sımpleks/ to *simpleks* /simpleks/ is considered as the more appropriate datum compared to the transfer of *design* /dıˈzaın/ to *desain* /desain/ in showing the adjustment of spelling without adjustment of pronunciation.

Table 5. *Naturalization taking place through the adjustment of spelling without adjustment of pronunciation*

No	Spelling		Pronunciation	
	English	Indonesian	English	Indonesian
1	simplex	*simpleks*	/'sımpleks/	/simpleks/

(1)simplex → simpleks

The translation of *simplex* /'sımpleks/ to *simpleks* /simpleks/ demonstrates that naturalization may occur through adaptation of spelling without any adjustments in pronunciation. This study proposed a different example compared to the one proposed by the committee of Indonesian language development (2006). As presented earlier, the committee had mentioned the change of form from the word *design* /dıˈzaın/→ *desain* /desain/ as the example of spelling adjustment without adaptation of pronunciation. In this study such a change was identified as naturalization type 2, i.e. adjustment of spelling with simple adjustment of pronunciation. This category is proposed to present the fact that the phonemic transcription of the two terms is different. In addition, the level of adjustment can be compared to the example of the fourth category of naturalization proposed in this study that is the adaption from *simplex* /'sımpleks/ to *simpleks* /simpleks/that did not undergo the adaptation of pronunciation.

Implication

Having done the investigation on types of naturalization, it is clear that in this study naturalization refers to translation procedure, which demonstrates the adjustments of form including spelling and pronunciation. Such adjustments must be automatically followed by transfer of meaning since the terms are borrowed through the process of adjusting the spelling and pronunciation. The source language terms are not replaced by the equivalents in the target language whose meaning is synonymous. Adaptation of linguistic elements, especially pronunciation can be observed from the adjustment of the sound segments from the source language terms to the target language terms. For spelling adjustments, the forming elements of words or phrases in the writing system are done by comparing the spelling of the terms in two different languages.

The results of this study that show four types of naturalization as seen in figure 1 lead to the implication of comparing the types of foreign adopted terms proposed in the Indonesian general guidance of term formation. The mapping of naturalization in this study and the existing classification in the guidance of term formation are compared to see whether the standard of term formation in Indonesia as mentioned in PUPI and designed by the committee of Indonesian language development in 2006 needs revisiting. This study is to give a recommendation to revisit the categories made on how foreign terms are adopted in the Indonesian language. The recommendation can be utilized as a reference to see language development from the perspective of translation studies. The results of the study also demonstrate the significance of investigating naturalization to scientifically observe the process of foreign terms adoption in the Indonesian language.

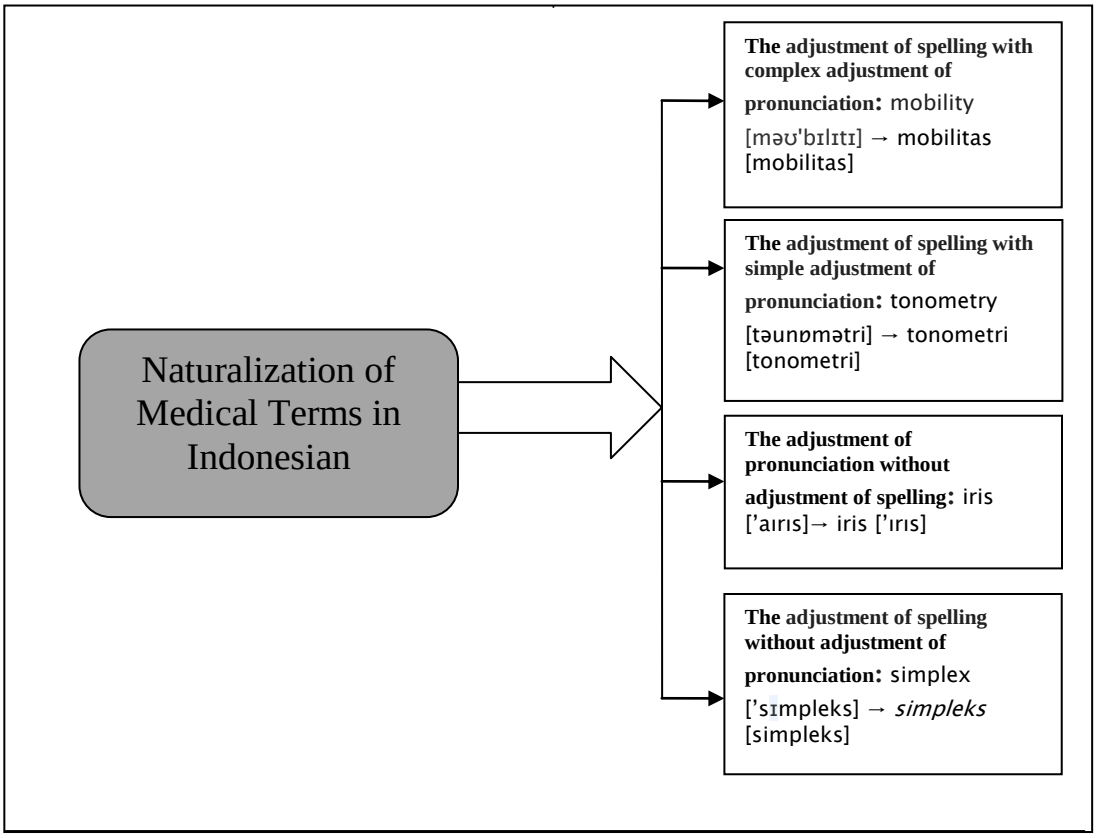

Figure 1. *Naturalization of Medical Terms in Indonesian (Jayantini, 2017)*

Naturalization in Indonesian

The patterns of naturalization mapped in this research are different to those of mentioned in the guidance of term formation (2007). Here, the four types of naturalization are based on the translation of medical terms that contribute much to add the number of foreign adopted terms into Indonesian. It is due to the characteristics of medical terms that are universally and globally used by the stakeholders so that naturalization with its various types is often the predominant procedure of translation utilized in the translation of medical terms. The absorption of foreign terms into Indonesian as mapped in this study, which is labeled "naturalization" in translation studies is considered having a layered category for adjustment of pronunciation and spelling. This study proposes two types of pronunciation adjustment. i.e. complex and simple that are not

specified in the diagram of foreign term adoption shown in PUPI. To be more specific, the comparison of naturalization reported in this study and the existing division of how foreign terms are adopted in the Indonesian language can be clearly seen in figure 1. The comparison is worth doing to support the recommendation made in this study to revisit the categories that have been shared and used from 2007.

Figure 1 demonstrates that in the classification of naturalization, it is found that four types of translation may be proposed in representing the phenomena of adjusting the pronunciation and spelling of foreign terms to the Indonesian language. Figure 1 is the mapping of naturalization in this study and figure 2 is the branches made for the phenomena of absorbing the foreign words and phrases in Indonesian designed by the Committee of Indonesian language development in 2006. Figure 2 has also four branches yet its categories are different. As shown in figure 2, translation contributes to the absorption of foreign terms when it is done based on the patterns determined by the general guidance of term formation. Figure 1 differentiates two types of pronunciation adjustment namely complex and simple. Patterns of spelling adjustment cannot be separated from how the terms are pronounced. The writing system for the terms undergoing pronunciation adjustment is commonly found in the Indonesian guidance that has listed many cases of changes. Meanwhile, figure 2 involves pure borrowing that is commonly called as transference on translation studies. This type is not included in figure 1 because the category is based on the changes, which is then called 'naturalization' or 'naturalized borrowing.' Transference takes place without any changes in pronunciation and spelling. It is understandable that in figure 2, pure borrowing is found to show the recognized phenomena of language contact. This type of borrowing also makes the addition to the Indonesian vocabulary possible.

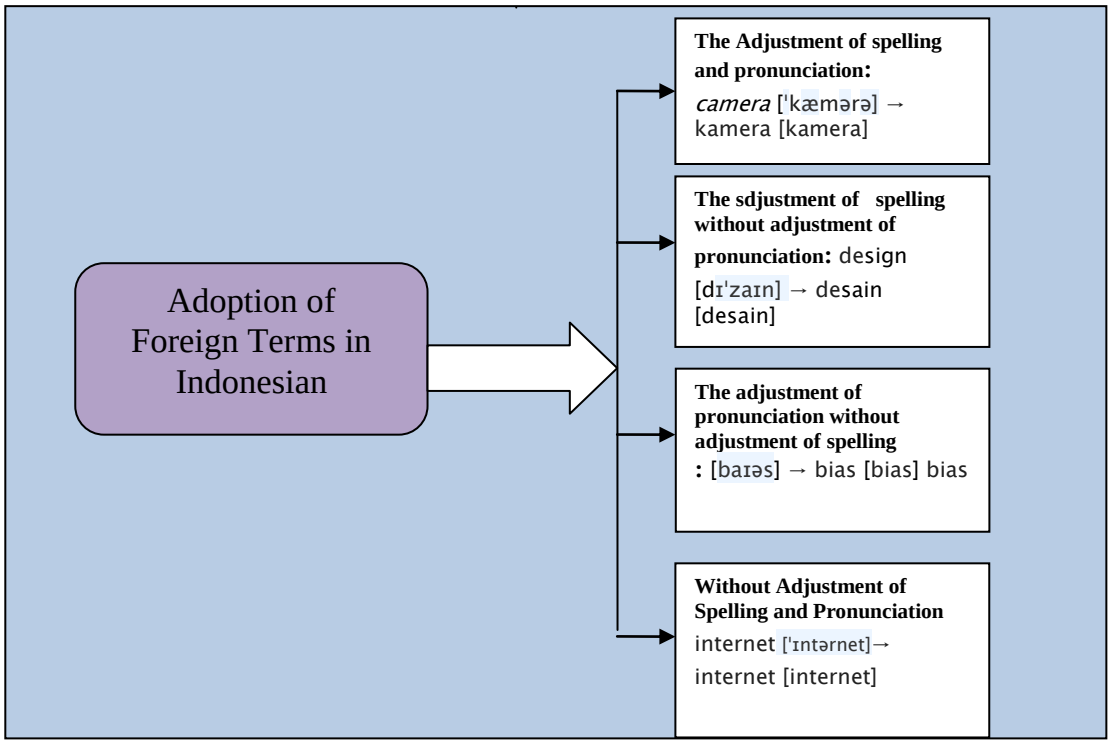

Figure 2. *Adoption of Foreign Terms in Indonesian Language (PUPI, 2007)*

The type of naturalization that is closer to translation proper is the type that is made in accordance with the naturalness in the target language. The results of this study reflect that

translation proper is realized through the adjustment of spelling and pronunciation with its two types. i.e. complex and simple. In medical text translation, naturalization with its various types is permissible to meet the accuracy, naturalness and readability in the translation results. This means that the accuracy may be directly gained since the terms are merely changed through linguistic form as proven in the each term' phonemic transcription. In terms of naturalness, type 1 and type 2 are more natural that the other two types because both pronunciation and spelling are adjusted. Meanwhile, for the other two types, the adjustment of pronunciation without adjustment of spelling (type 3) and adjustment involving spelling without adjustment of pronunciation (type 4) are not the predominant cases to occur. It is due to the different phonological system that influences the spelling of the terms. These types are considered less natural compared to the other two types. In the last two cases, the changes must be observed clearly since they do not undergo the spelling and pronunciation at the same time.

Conclusion

Having done the analysis, this study found two significant results in accordance with the objectives of the study. The discussion focuses on the types of naturalization that demonstrate how foreign terms are adopted into Indonesian and whether the adoption process has been in line with the Indonesian standard. This means that this study has made further investigation on naturalization as a frequently utilized procedure in translating English medical terms into Indonesian.

First, four types of naturalization are found as the representation of naturalization in the Indonesian language. Each type has its own characteristics showing how complex and simple the adjustment of pronunciation and spelling occur. This study has made different classification that is not exactly the same with the existing proposed term formation in Indonesian. The classification in this study is done on the basis of closer observation concerning the phonemic transcription comparison between the English and Indonesian terms. The most significant difference is on the classification of pronunciation adjustment. The committee of the Indonesian language development identified that naturalization only takes place in the form of spelling and pronunciation adjustments without differentiating the complexity of sound changes from English into Indonesian.

Second, in terms of spelling adjustment the translation of the English-Indonesian medical terms has been done in accordance with the Indonesian rules determined in the Indonesian spelling standard. The adjustment of spelling cannot be separated from how the naturalized terms are pronounced. Several rules of spelling adjustment are applied perfectly in the translation. However, new adjustment standards must be considered whenever revision is made by the authority since several adjustments found in this study has not been covered in the guidance.

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