CHAPTER THREE
RESEARCH METHODOLOGY

This chapter discusses the methodology of this research. It consists of the formulation of research problem, research design, data collection, and data analysis.

1.1.   Formulation of Research Problems

The purpose of this research is to discover the sound changes that happen during the process of linguistic borrowing from English to Esperanto and to reveal what influenced the changes. Thus, the research problems are formulated as follows:

a. What categories and types of sound change are there which occurr in Esperanto loanwords of English origin?
b. What are the factors that trigger the sound changes?

1.2.   Research Design

This present study employs a qualitative research approach. According to Cresswell (2009), one of the purposes of a qualitative research approach is to reveal the systematical procedural clues, which is in line with this study that aims to reveal the procedure of sound changes from English to Esperanto. As Neuman (2003) states that a qualitative research approach relies on the knowledge of the researcher during the analysis, thus a proper theoretical background has to be employed in order to be able to analyze the data objectively. The field of study of this research is historical linguistics and using sound change (Crowley, 1997; Campbell, 2004) as the theoretical framework for this research.

The qualitative research method is appropriate to be applied in this research in order to describe, elaborate, and analyze the findings. However, descriptive statistics

is necessary to describe the percentage of occurrence of a particular sound change. It has to be done in order to have an insight of which sound change occurs the most and is more influential than the others. The frequency of the sound change is counted with a formula as follows:

$$n_1\% = \frac{n_1}{\Sigma n} \times 100\%$$

n_1 = the total occurrence of a particular sound change,

Σn = the total occurrence of all sound change.

1.3.   Data Collection

The data are in the form of words which are the Esperanto words of English origin and they were collected from *Konciza Etimologia Vortaro* or The Concise Etymological Dictionary. *Konciza Etimologia Vortaro* is an etymological dictionary for Esperanto (Cherpillod, 2007). It describes the etymology of each Esperanto words with the native word for each borrowed word. The words under this investigation are borrowed according to the pronunciation, and there are a total number of 195 words that were collected.

The dictionary itself does not provide the information whether a word is borrowed phonetically or orthographically, therefore the process of data selection relies on the judgment of the writer. However, in the process of data selection, the literature from Neergaard (2001), *Fremdvortoj en Esperanto* or Foreign Words in Esperanto, serves as the base of the judgment in attempting to provide objective judgment.

Besides the Esperanto words, the English words of each loanword is also taken as a data to trace the sound change between the English and Esperanto words.

1.4. Data Analysis

The data are analyzed in order to reveal the pattern of sound change in Esperanto words of English origin, thus paving a way to trace the type of sound change. According to Miles & Huberman (1984), in order to analyze the data, there are three steps that should be performed, namely data reduction, data display, and conclusion drawing.

Data reduction aims to eliminate, simplify, and transform the collected data. It consists of selecting, focusing, and abstracting certain data. In this study, the process of data reduction is performed to eliminate unnecessary data, i.e. words borrowed according to the orthography. Besides, the data that are in form of words are transformed to their phonetic transcription, Esperanto words are transcribed using *Plena Ilustrita Vortaro* or The Full Illustrated Dictionary (Sennacieca Asocio Tutmonda, 2003), while English words are transcribed using Collins Dictionary. The phonetic transcription of the data are used to refer to the standard pronunciation of the languages. Besides, due to the temporal and spatial limitations, data collection through actual speech recording from English and Esperanto native speaker cannot be conducted.

After the data reduction and the necessary data remains, the next process is data display. It refers to the process when the data are displayed in order to organize the information in a certain assemble. In this study, the process of data display consists of displaying the phonetic transcription of English and Esperanto words in form of table in order to be able to trace the sound change.

The last process is conclusion drawing, in which the process of noting patterns and deciding the meaning of the pattern is held. In this study, this process involves with the tracing of the phonetic changes from English to Esperanto, as well as gathering the pattern of the sound change to find the type of sound change. Moreover, in this process, the frequency of each changes are also counted.

Additionally, literature review of Waringhien's compilation of Zamenhof's writing from 1889 until 1912 (1990) is employed to describe the causes of sound change during the creation of Esperanto.

1.5.   Example of Data Analysis

In this study, English is the donor language and Esperanto is the recipient language, as Esperanto borrowed words from English. This set of data is found to be the pair of original words and borrowed words:

Table 1.1 Examples of Esperanto loanwords of English origin

No.	Esperanto words	English word
1.	Adzo	Adze
2.	Akno	Acne
3.	Aksono	Axon
4.	Atolo	Atoll

After the process of data reduction, the data are displayed as follows:

Table 1.2 Phonetic transcription of Esperanto and English words

No.	Esperanto words	English word	Gloss
1.	ˈadzo	ædz	Adze
2.	ˈakno	ˈæknɪ	Acne
3.	akˈsono	ˈæksɒn	Axon
4.	aˈtolo	ˈætɒl	Atoll

In the process of conclusion drawing, the findings are presented as follows:

Table 1.3 Sound changes from English to Esperanto

Gloss	English	Esperanto	Changes	Description
Adze	ædz	ˈadzo	æ→a	Near-open front unrounded vowel undergoing vowel lowering to open front unrounded vowel
			ø→o/__#	Close-mid back rounded vowel is added at the end of the word
Acne	ˈæknɪ	ˈakno	æ→a	Near-open front unrounded vowel undergoing vowel lowering to open front unrounded vowel
			ɪ→o	Near-close near-front unrounded vowel undergoing vowel backing and vowel lowering to close-mid back rounded vowel
Axon	ˈæksɒn	akˈsono	æ→a	Near-open front unrounded vowel undergoing vowel lowering to open front unrounded vowel
			ɒ→o	Open back rounded vowel undergoing vowel raising to close-mid back rounded vowel.
			ø→o/__#	Close-mid back rounded vowel is added at the end of the word
Atoll	ˈætɒl	aˈtolo	æ→a	Near-open front unrounded vowel undergoing vowel lowering to open front unrounded vowel
			ɒ→o	Open back rounded vowel undergoing vowel raising to close-mid back rounded vowel.
			ø→o/__#	Close-mid back rounded vowel is added at the end of the word

From the example data set, several common patterns of sound changes are shared in the data set. The patterns are:

æ➔a   Near-open front unrounded vowel undergoing vowel lowering to open front unrounded vowel. This sound change occurs as Esperanto has no /æ/ sound, therefore it is changed to a similar sound, i.e. /a/ that presents in Esperanto. This change occurs 40% in the data set.

ø➔o/__#   Close-mid back rounded vowel is added at the end of the word. This sound addition occurs to fulfill the Esperanto morphological rules that a noun should always end in /o/. This change occurs 30% in the data set

ɒ➔o   Open back rounded vowel undergoing vowel raising to close-mid back rounded vowel. This sound change occurs as the sound /ɒ/ is not recognized in Esperanto, thus it is changed to a similar sound /o/. This change occurs 20% in the data set

In addition, there is also one sound change that happens only once in the data set, i.e.

ɪ➔o   Near-close near-front unrounded vowel undergoing vowel backing and vowel lowering to close-mid back rounded vowel. This sound change might seem peculiar for there are more than one type of sound change occurred. This change occurred not to facilitate the phonological rules of Esperanto, but rather a morphological one, that any Esperanto nouns should end in /o/. This change occurs only 10% in the data set.

Therefore, with this sample data set, it can be concluded that there are several sound changes involved, i.e. vowel lowering for 40%, sound addition for 30%, vowel raising for 20%, and vowel backing and vowel lowering for 10%. Some changes occur to fulfill the phonological rule of Esperanto, while the other occur to fulfill the morphological rule of Esperanto. This phenomenon, sound changes to facilitate morphological rules, might exist in Esperanto because as a constructed language it should follow the rules that are prescribed by the author.

1.6.   Closing Remarks

This present chapter has delivered the research methodology of this study together with the example of data analysis. In the next chapter, the findings and analysis from full set of the data will be presented.