

CHAPTER 3: METHODOLOGY

3.1 Introduction

Bearing in mind the ideas above, the focal purpose of this study is twofold: first, to compare interactive online reading (IOR) and traditional print reading (TPR) in terms of how these two modes affect the content quality of argumentative writing and, second, how they affect students' vocabulary use in their argumentative writing. This aim is based on the constructivist theory in a technology-supported environment as this study intends to identify which reading mode or setting is more likely to benefit students' writing.

The main portion of the data was gathered in a format that would enable the application of qualitative analysis procedures. Other parts of the data were analyzed by applying online quantitative procedures. The following sub-sections will expound the methodology and the rationale for employing the participants, research tools, data collection procedures and data processing procedures; ethical considerations will also be touched upon.

3.2 Theoretical Framework

A traditional method of teaching and learning is the 'chalk and talk' method: the instructional medium used is mainly a printed book, the teacher is seen as the provider of knowledge and students passively receive this knowledge (Tse-Kian, 2003). Thus, the learning mode tends to be sedentary and the learners play little or no part in their learning process.

On the other hand, the constructivist learning mode prescribes a learning process where students work individually or in small groups to explore and solve problems and actively seek information, rather than being passive recipients. This constructivist learning approach has its foundations in cognitive learning psychology (Jonassen, Perk and Wilson, 1999), and is rooted in theories by Dewey (1896), Piaget (1952), Vygotsky (1978) and

Papert (1980) (as cited in Tse-Kian, 2003). It works on the assumption that productive learning takes place in an active, learner-centered classroom, where learners find their own information and construct their own knowledge. In order for this to occur, Reeves (1992) states,

A rich learning environment is seen as a major goal in constructivism where prime emphasis is placed on the unique interest, styles, motivations and capabilities of individual learners so that learning environments can be tailored to them (p.3)

Therefore, considerable attention is given to the environments in which teaching and learning take place. This theory is most suitable and relevant to this study as it intends to investigate the effect of two different learning environments on students' learning by assessing their output text, i.e. the piece of writing. The relevance of constructivism will be further discussed in Chapter 5.

It must be made clear that the use of this constructivist theory does not mean that this is the only theory that could be used to explain all ESL education settings. Nevertheless, for this particular study, this theory does serve the purpose as it is based on the same principles.

3.3 Experiment

The experimental design used in the current study is comparable to that of previous studies, e.g. Mayer & Moreno (2000), Baker (2003), Loucky (2005), Usó-Juan and Ruiz-Madrid (2009), and Roswell and Burke (2009), all of which employ similar research strategies and have yielded many insightful findings as elaborated in Chapter 2. The main components of the present experimental study, i.e. participants, setting, stimuli, research tools and data collection and processing procedures, will be discussed in more detail below.

3.3.1 Setting

The experimental study was conducted in the computer lab. Each participant had their own individual computer terminal, where they read the online interactive or the traditional print article, as this was practical for the study. Participants then typed their argumentative essay using Microsoft 2007 software and saved it into a common folder created by the researcher on the online portal.

3.3.2 Participants

The pool of participants consisted of 45 first-year (freshman) American Degree Program students ($n = 45$) between the ages of 17 and 19 years, enrolled at a private institute of higher education in Malaysia. All students were taught by the researcher and were enrolled in the compulsory English 101 course. The primary objective of this course is to improve students' critical thinking skills and scholarly writing in a variety of academic genres. The researcher taught both groups of participants and each class met thrice a week for 75 minutes each session. This pool of participants consisted of 26 females and 19 males. As for nationality, there were 39 Malaysians, 1 Nigerian, 1 Indonesian, 1 Burmese and 3 Koreans. These participants were randomly placed into classes by the administration and were subsequently divided into two groups by the researcher in order to conduct the experiment: Group A and Group B, each comprising 23 and 22 participants respectively.

The level of proficiency of the participants was similar as they were placed into the respective class based on their Sijil Pelajaran Malaysia (SPM) English results and all participants achieved an A or A+. In addition, there were 5 international students in this class and they were placed there according to their International English Language Testing System (IELTS) (Band 5.5- 6.5) and Testing of English as a Foreign Language (ToEFL) iBT (85 and above) scores, which are equivalent to the Malaysian SPM levels. As an extra measure, a placement test was administered to ensure that the participants were of equal

proficiency levels and that their level of English prior to the course would not be a confounding variable.

Argumentative essay writing was taught in the sixth and seventh weeks of the semester. One lesson was dedicated to introducing argumentative essay writing and relevant examples were shown. In the following lesson, the nature and structure of the argumentative essay was taught. After this, two lessons were used for the experiments.

3.3.3 Stimuli

Both groups of participants were given the exact same text containing the same information in terms of reading content and language. The only difference was the different presentation modes: Group A read the text in the traditional print format (Appendix 18), whereas Group B read the same text online via the online interactive website: www.nps.gov/history/museum/exhibits/alca/overview.html - this in keeping with the theme of Crime and Punishment in the syllabus. To further reduce any external influences, the experiment was conducted after first teaching the basic structure and nature of argumentative essay writing.

This website was deemed most suitable as it offers unbiased and in-depth information about prison life in Alcatraz and covers the following information: history, inmates, food, medical treatment, work, recreational activities and standard procedures. In order to ensure reliability and authenticity of the stimulus, the site mentioned above was chosen as it was developed by the National Park Service US Department of the Interior under the Museum Management Program in 2005 and is reputed for creating impartial virtual and interactive sites for academics and the purpose of teaching and learning. Figure 3.1 below shows examples of the stimuli via the interactive online format.

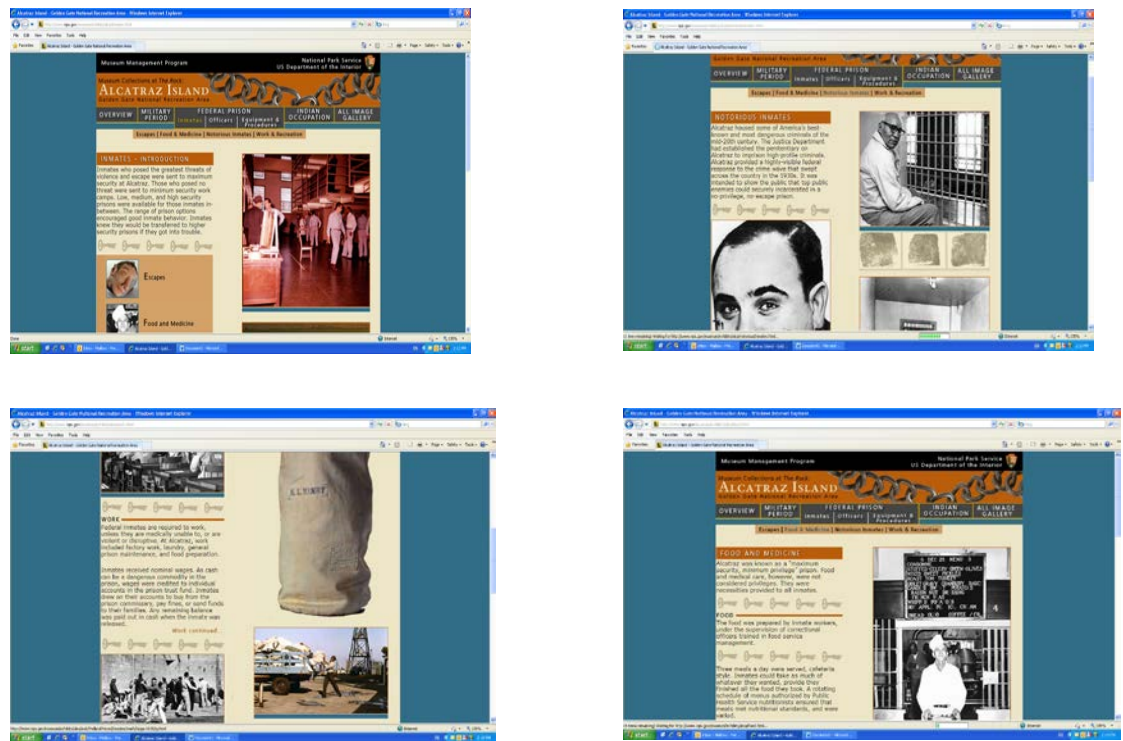


Figure 3.1: Interactive Online reading layout

3.4. Procedure

To ensure validity, the participants were exposed to two traditional and two online interactive reading texts. The experiment was conducted twice (repeated) and over the span of a week, using two different links available on the website.

3.4.1 Experiment 1

The researcher explained the guidelines to the participants and revealed the argumentative essay question that the participants had to answer by the end of the lesson. Both groups of participants were given 15 minutes to read the text via the different modes; Group A read in print and Group B read the online interactive version of the same article on the Overview and History of Alcatraz comprising Military Period, Notorious Inmates and Indian Occupation hyperlinks which comprised 771 words. The amount of time allocated was in accordance with the average reading speed of 250 words per minute and was adequate, as the time allocated also took into consideration time for downloading and

opening the hyperlinks on the website. Then the participants had 10 minutes to reflect and formulate their own thoughts regarding the topic. Consequently, the participants were given 60 minutes to compose and type an argumentative essay of 280-320 words on the topic entitled: 'In your opinion, should prisons be turned into tourist attractions?' Upon completion, participants had to save their essays into a shared folder on the computer.

3.4.2 Experiment 2

In the following lesson, the procedure above was repeated but referred to a different section of the website offering information on Federal Prison, Inmates, Food and Medicine, Work and Recreation and Equipment and Procedures; this text consisted of 995 words. Participants were to compose an argumentative piece on the topic: 'Imprisonment - Does it deter crime?' along the same guidelines as those in Experiment 1. The information from the website for both argumentative questions is equivalent as they are similar in terms of layout, font, colors and general design. For further reference, the data-collecting and analysis procedures are depicted diagrammatically in Figure 3.2 on page 54.

3.5 Data

The computer was seen as the most appropriate medium for students to compose, type and save their argumentative essays as it was less time-consuming; it also enabled the participants to self-edit their essays using the basic grammar and spelling editing software available with Microsoft 2007. A parallel method was adapted by Gilmore (2009) and Friedman (2009) to identify the usefulness on online corpora for improving writing skills without being perturbed by basic grammatical errors. In this way, the researcher was able to gather authentic data written by the respondents themselves and was able to focus on the two main issues of this study: quality of content and vocabulary, with minimal grammatical errors. For the final analysis, a total of 46 essays from Group A and 44 essays from Group B comprising an accumulative total of 90 essays were used for analysis.

3.6 Analysis Tools

The data was rendered into a form that would allow for both quantitative and qualitative analysis procedures. For effective and in-depth analysis, the Online Vocabulary Profiler software called Web VP v3 (www.lex tutor.ca/vp/eng) and a systematic content analysis from participants' argumentative essay were considered to be most suitable. In the following subsections, both choices will be discussed in more detail.

3.6.1. Content Analysis for Qualitative findings

To answer the first research question of this study, which was to identify the impact of print and online interactive reading modes on the quality of arguments, a content analysis of the data obtained was undertaken. Content analysis is deemed the most suitable method to make sense of the data collected for this study; to quote Merriam (2009),

'...the communication of meaning is the focus....and the process involves the simultaneous coding of raw data and the construction of categories that capture relevant characteristics of the documents' content' (p. 205).

To ensure the analysis was valid and comprehensive, the grading rubric for argumentative essay used by Harrell (2005) (Appendix 1) was employed and modified to suit the needs of this study. This particular grading rubric was developed based upon Bloom's Taxonomy (1956), which has recently been revised, and brings out more clearly the distinction between retention and transfer (Harrell, 2005), which was also the underlying focus of this study.

According to this adapted rubric Bloom's taxonomy has in fact two dimensions: one for types of knowledge, and one for types of cognitive processes. Harrell (2005) argues that:

The different types of knowledge represent divisions along a continuum that ranges from concrete to abstract. One of the types of cognitive processes (remembering) indicates the process used for retention of, while the other five (understanding, applying, analyzing,

evaluating and creating) are increasingly relevant to the transfer of, each of the types of knowledge (p. 3).

Although grading rubrics used in a study by McNamara et al. (2010) were also reviewed, Harrell's (2005) rubric was considered most appropriate for the nature of this study as it was clear, meticulous and covered all aspects of argumentative essays. The grading rubric guiding the study by Harrell (2005) included all the aspects of an argumentative essay such as: Content, Understanding, Evaluation, Creation, Style and Organisation. Since the main emphasis of the current study is on the quality of argument, the section on Content was relied upon. This section is divided into the central aspects of quality arguments; Thesis, Premise, Support, and Counter-arguments. These features were further assessed based on a scale comprising 4 categories ranging from; Excellent, Good, Needs Improvement and Unacceptable.

The modified version used in our research (Appendix 2) merges the 'Excellent' and 'Good' categories and renames 'Needs Improvement' into 'Average' and 'Unacceptable' into 'Poor' to simplify the qualitative analysis of the arguments. In addition, the content section of the rubric was also customized so as to focus more clearly on the three main aspects of content in argumentative essays namely: Thesis, Support and Counter-arguments. As coding is central to any qualitative study, the analysis of the data was entirely guided by the scales in the rubric, and all the data would be coded and reported accordingly.

3.6.2. Online Vocabulary Profiler for Quantitative finding

To answer the other research question of this study, i.e. to assess the effect, if any, of online interactive and print reading on college students' use of topic-specific vocabulary in argumentative writing, a quantitative methodology was utilized. From studies reviewed in Chapter 2, a fixed list of topic-specific vocabulary was compiled from the reading article and was cross-checked with (i) the Longman (1993) Language Activator under the section

of Crime and Prison and (ii) Barton and Sardinias's (2004) North Star Reading and Writing for Intermediate and Higher-Intermediate levels, which also covers the topic of 'Crime and Punishment'. Through this cross-checking, the reliability of the study can be validated as the words are commonly found in this specific topic. Subsequently, a vocabulary list comprising 30 words was generated (Appendix 3) for Experiment 1. This list of words comprised words related to the topic such as: convict, escape, notorious, etc. and another vocabulary list for Experiment 2 (Appendix 4) consisting of 34 words, with words such as: offenders, handcuffs, release, violating, etc.

For an accurate and meaningful analysis of the lexical data, one of the more reliable and convenient tools is the 'Vocabulary Profiler' software called Web VP v3 Classic available at www.lex tutor.ca/vp/eng. This study is interested in the amount of vocabulary present in the input reading text that is actually used in the essays, and whether the reading mode has any effect on this. Therefore, this software was suitable as it not only identified the specific words from the vocabulary list downloaded, but also ensured the accuracy of the words used in the lexical sense (correct meaning).

Muncie (2002), Hancioglu and Eldrige (2010) and other recent studies on vocabulary have also employed the use of this software as it is seen to be easily accessible and less confusing to use than rival tools. Also, it provides instant data about texts. Finally, it focuses on the accuracy of the vocabulary used. The words were analyzed by dividing them into two categories: types and tokens. The number of words in a text is referred to as the number of tokens. However, several of these tokens are repeated within the text. For instance, the word 'time' is considered token, whereas words like 'times' and 'timely' were considered 'types' and this relationship is known as the 'type-token-ratio'. Subsequently, Hancioglu and Eldrige's (2010) suggest that when data is tabulated using this software and

the findings analyzed quantitatively, the type-token ratio is shown to be a helpful measure of lexical variety within a text. For this it can be used to monitor changes in vocabulary use.

3.7 Analysis

The data was evaluated by the researcher, who also conducted the two experiments. It was easier this way and also reduced any variables which would have negatively affected the study's outcome. To ensure the trustworthiness of a qualitative study, Patton (2002) suggests a related strategy, that of 'triangulating analysis – which involves having two or more persons independently analyzing the same qualitative data and comparing the findings of the study' (p.560). This approach was implemented in this study, whereby the data was moderated by the researcher's supervisor, a professional with vast experience in the field of linguistics, which increased the credibility of the findings. Therefore, the study is inter-rater reliable and the triangulation of the experiment and investigators further validated the findings (Merriam, 2009). The whole process of collecting and analyzing data is shown in Figure 3.2, on the next page for easier understanding of the methodological choices made in this study.

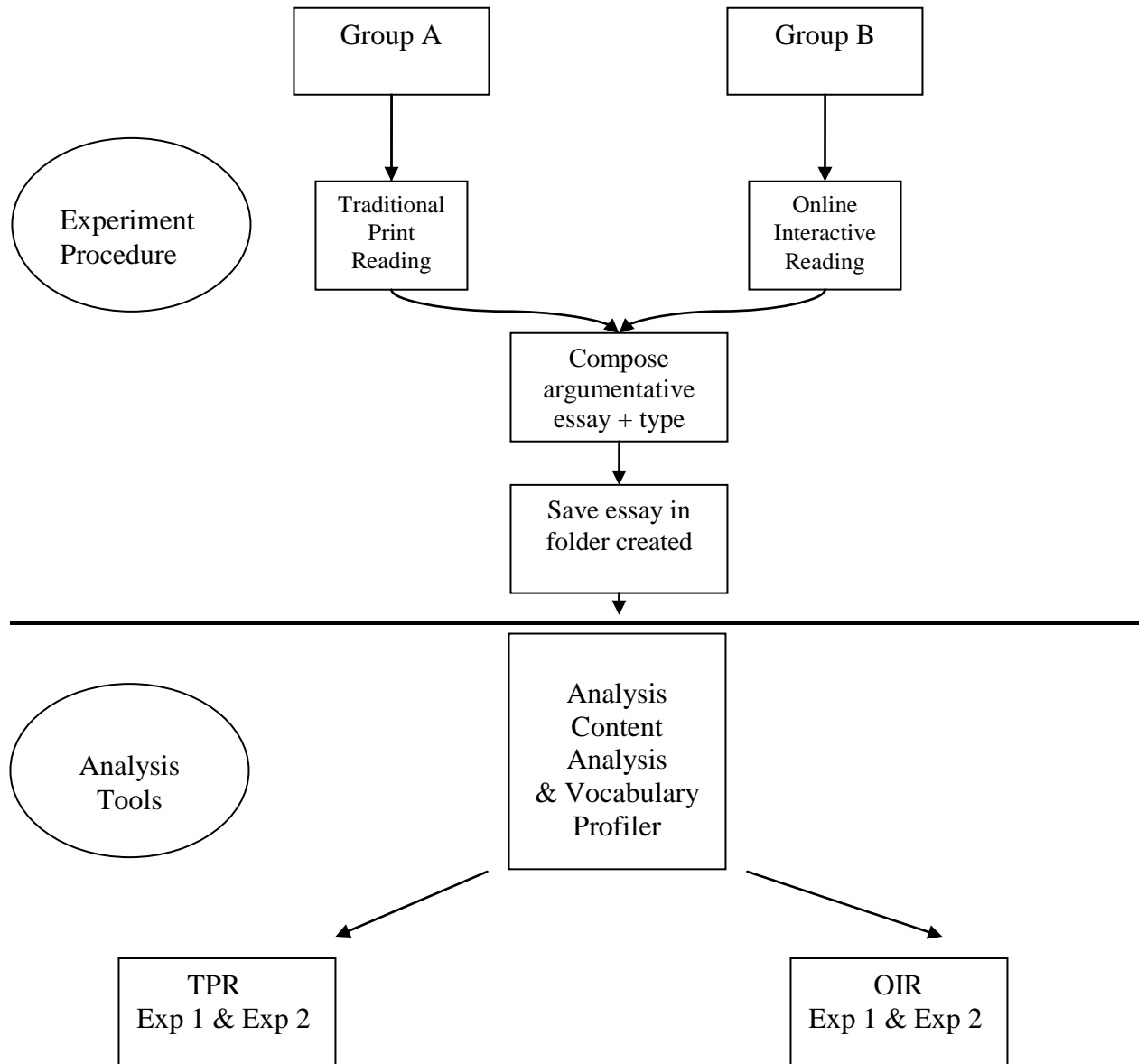


Figure 3.2: Experiment Process

3.8 Ethical Issues

The ethical issues taken into consideration while carrying out this study are as follows:

- a) The privacy of the respondents was maintained throughout the whole study and participants remained anonymous throughout. To ensure this, codes were used for the samples in the appendices.

- b) It was made clear at the beginning of each experiment that no one was forced to participate in this study and that they could withdraw from participating at any time. The participants' positive replies when approached regarding this research study were taken as proof that the participants consented to be the participants of this study.
- c) The data obtained was to be used solely for research purposes. This was made clear at the beginning of each experiment.
- d) Data was not manipulated, i.e. the findings would be reported in its authentic form.

3.9 Summary

The methodology pursued, covering the experiment, procedures, stimuli, and data analysis procedures, was based on the objectives and research questions of this study as stated in Chapter One. The literature reviewed in Chapter Two has facilitated in defining the appropriate procedures to be used, thus ensuring that the research questions would be addressed in the most suitable way. The following chapter will present the findings, followed by insights obtained from the analysis.