CHAPTER 3

METHODOLOGY

3.0 Introduction

The objective of this study is to find out the students' perceptions of the CT skills, having undergone the CT skills course of the WS programme. It also aims to find out whether the strategies employed by the tutors during the course had contributed towards the development of critical thinking among the students. Furthermore, the study also seeks to find out if the course assessment measures critical thinking skills and also if there is a correlation between the students' perceptions of their CT skills and their performance in the final exam.

Based on the review of literature in Chapter Two, it can be viewed that CT has become the buzz word among teachers and educators today. In order to pursue life-long education, one has to become critical in one's thinking, which would ultimately, direct one to be an independent learner.

Thus, this chapter describes the approach, the subjects of the study, the procedures adopted, the design of the study and the statistical analysis used.
3.1 Teaching of WS

The students are encouraged to work independently, and with peers, gathering information from various sources, and in the process, discover, build and develop their reading and referencing skills. Class sessions include lectures, forums, discussions and analysis of text, which provide opportunities for the students to think, question, analyze and present their views on various world issues. In this process, the students develop skills that will carry them through the degree programme.

During the World Studies lessons, students are exposed to the various issues related to a particular topic of study. For example, in the theme of ‘war’, students would be asked to brainstorm all the issues related to this topic. Students would bring out issues such as why countries wage wars, the consequences of wars, the results of wars, the political, social and economic implications of wars, etc. Very often the students would argue and role-play these issues in order to find out all the details pertaining to the above mentioned issues.

3.2 Approach

The approach used in this study is both qualitative and quantitative. The study is based on two sets of questionnaires and document evidence of examination questions and results. Two sets of questionnaires were designed, one for the students and the other was
for the WS tutors. As for the document evidence, four years WS Final Examination questions from the years 1995 to 1998 were analysed.

The questionnaires were administered to the Matriculation students and also to the WS tutors. The results of the questionnaires were tabulated using frequency count and percentages. This data was then analysed based on the research questions.

The four years’ examination questions were analysed to find out whether CT skills have been included. In order to make the study valid, the framework of Marzano (1992) was used.

3.3 The Subjects of the Study

The subjects of this study are students and tutors of Maktab Perguruan Ilmu Khas (MPIK) which is located in Cheras, Kuala Lumpur, Malaysia and five colleges that is, the College of St Mark and St John, Chichester Institute of Higher Education, St Mary’s College, Moray House and Canterbury College in United Kingdom. The students are pursuing a programme called the MPIK–UK Link programme. They would pursue the first two years of the degree course, after their two years of Matriculation, in MPIK. During the third year, they would be attached to any of the five colleges in UK. They would return to Malaysia to complete the fourth year.

The students, who have been selected for this study, are a group of first year degree students. They have completed two years of matriculation. It was during the matriculation
course that they were introduced to the WS component. For the specific purpose of carrying out this study, all the one hundred students in this programme were selected. Twenty of them were involved in the pilot study. Questionnaires were administered to the eighty of them.

The tutors selected for this study were eight lecturers who have taught in the course during the matriculation programme. These tutors are not teaching the component now, as the respondents were the last cohort of this link programme. The tutors were asked to reflect upon the strategies, and teaching that took place during their classes.

3.4 Design and Instruments

3.4.1: Students' Questionnaire (Refer: Appendix A)

The students' questionnaire consists of fifty items. The students were asked to respond using the Likert Scale. These items are basically to find out the skills they have acquired after going through the WS course for a period of two years.

Warnick and et al (1994) have mentioned that CT involves the ability to explore a problem, question or situation. One then has to integrate all the available information about the problem or situation and arrive at a solution and justify one's position based on this information. They further mention that CT involves many specific skills - such as analysing and evaluating evidence, identifying relevant questions, drawing sound inferences, generating plausible solutions and hypothesis, detecting errors in other's
reasoning, stating implicit assumptions and understanding the implications of an argument.

Basically the fifty items are related to the above sub-skills of CT. Item 1 and 2 are to find out if the students have achieved the skills of categorising the strengths and weaknesses of an issue. Item 3 is to find out if the students are able to consider other people's views. This item is to create an awareness that one has to be objective in accepting the views of others. Item 4 is to find out if one is able to solve a problem efficiently, while item 5 is to find out if a student has an independent mind. This item is to an extent to determine if a student has acquired the ability to make his or her stand clear without any other external influence.

Items 6 and 7 are to find out if the students have the ability to communicate ideas and feelings clearly. This has to do with the skill of being able to justify one's claim without any bias. Items 8 and 9 are to find out if one has mastered the skills of evaluating evidence and arguments critically and also being able to analyse a situation or an issue in the form of mind maps.

Items 10 and 11 are to find out if students have acquired the skills of gathering and organizing relevant information. Item 12 pertains to the skills of reorganizing a problem while item 13 is being able to define a problem or an issue. Item 14 is purely to find out if one has mastered the skills of planning strategies for an argument or rebuttal. Item 15 is to find out if one is able to monitor one's own performance, while item 16 is related to item
14 whereby in item 16 one is able to revise plans or strategies to meet original goals. Item 17 is to be able to evaluate one’s performance.

Items 18, 19 and 20 are related to both oral and written communication. These items are to find out if students have acquired the skills of communication such as asking questions and clarifying issues, being able to reflect and use previous knowledge and experiences in discussions. Item 21 is to find out if students have mastered the skill of analysing problems into their specific categories.

Items 22 and 23 are related to searching and creating data from library resources. Item 26 is to find out if students read widely for current issues. The skill is important so that students are able to substantiate the claims that they make during their discussions. Item 24 is related to the ability of translating problems into a task with explicit objectives, while item 25 is about being able to select and organize relevant information. The skill of being able to select relevant information is vital as the corpus of knowledge and information is extremely enormous. Item 27 is about the skill of being able to speak one’s mind clearly during discussions.

Items 28 and 29 have to do with the skills of being able to work in pairs and groups during discussions. Item 30 is to find out if one is able to disagree during arguments without being emotional. Items 31 and 32 are related to being able to identify weaknesses in the comments and arguments made by tutors. These two items are to find out if one is critical of others’ views. Items 34 and 35 refer to the skills of being able to
participate during forums and debates, because during these activities, one has to be able to defend one’s claim objectively. On the contrary, item 33 is to find out if one is able to contribute ideas to fellow friends during presentations.

Item 36 is related to the ability of transferring ideas and thoughts into graphics and non-linear patterns. Item 37 has to do with the skill of being diplomatic, when dealing with friends. Items 38 and 39 have to do with the ability to explain an issue critically and also being able to justify the stand adopted. Items 40, 41, 42 and 43 are very much related to the skills of being able to compare the cause and effect of social, economic, political and cultural issues.

Items 44 and 45 deal with the ability of predicting outcomes and drawing conclusions from situations. Items 46, 47 and 48 are related to the ability to evaluate the credibility and significance of arguments. Item 49 is to find out if one would react without much thinking. The last item in the questionnaire is to find out if one is also self-critical, that is, being able to evaluate the effectiveness of one’s actions in handling an issue or problem.

3.4.2 WS Tutors’ Questionnaire (Refer Appendix B)

The tutors’ questionnaire is organised into three sections: Strategies, Group Work and Discussion and Resource materials. The respondents have to circle the numbers based on a five-point Likert scale.
Section A deals with strategies adopted by tutors during the teaching of WS. This section is to find out the extent to which the tutors have included strategies that promote CT among students during their teaching.

Item 1 is to find out if students were given opportunities to think and solve problems. Item 2 is to find out if tasks were presented as problems. Items 3 and 4 are to find out if the tutors disclosed the problems or asked the students to decide on a problem. Items 5 and 6 are to find out if tutors had encouraged students to look at resource materials critically and to plan their work. Items 7 and 8 have to do with asking students to evaluate their strategies and evidence from text materials. Item 9 is to find out if tutors helped students to look for strengths and weaknesses in an issue. Item 10 is to find out if students were asked to make judgements critically. Item 11 is to find out if the students were asked to reflect on what they had achieved. Item 12 is to find out if students were given opportunities to communicate their ideas while item 13 is to find out if students were encouraged to listen to each other and seek clarification.

Section B of the tutors' questionnaire comprises of 18 items, which are included to find out about group work and classroom discussions.

Item 1 of this section is to find out if time was given to the students for discussion. Item 2 is to find out if tutors called upon students for participation. Item 3 is related to the question of drawing from previous knowledge and experiences. Item 4 is to find out if tutors provided opportunities for students to cooperate, while item 5 is to find out if
students were given chances to develop their social skills. Items 6 and 7 have to do with tutors' ability in handling misunderstanding among students both constructively and sensitively. Item 8 is to find out if tutors gave a wide range of problem-solving activities during discussions, while item 9 is to find out if open-ended tasks were given. Item 10 is to find out if tutors encouraged students to work in small groups. Item 11 is to find out if students' oral skills are developed. Item 12 is to find out if tutors indicated to their students that they were not necessarily looking for the correct answer. Item 13 is to find out if aspects from the topic of discussion are integrated while item 14 is to find out if tutors summarised aspects from a topic of discussion. Item 15 is to find out if tutors allowed students to see their peer's written assignments, while item 16 is to find out if tutors provoked their students to talk by creating issues from discussion. Item 17 is to find out if tutors monitored discussions closely while item 18 is to find out if students were encouraged to plan their answers before presenting them.

Section C of the questionnaire is regarding the use of resource materials during World Studies lessons.

Item 1 of this section is to find out if tutors provided visuals to stimulate students' ideas, while item 2 is to find out if tutors prepared their own resource materials. Item 3 is to find out if tutors adapted and adopted resource materials from other sources. Item 4 is to find out if students were allowed to read widely while item 5 is to find out if students were encouraged to do library research. Item 6 is to find out if tutors required students to bring along articles and materials from other sources for discussions. Item 7 is to find out if
excellent pieces of work were discussed in class, while item 8 is to find out if students were encouraged to keep portfolios. Item 9 is to find out if tutors discussed past years test and examination reports. Item 10 is to find out if students used newspaper and magazine articles for discussion. Item 11 is to find out if tutors provided correct answers for students’ discussion while item 12 is to find out if students were provided with model answers for examination questions.

3.4.3 Description of WS examination questions from the years 1995 to 1998

At the end of the two-year matriculation course, the students sit for an examination. The WS component is tested at this examination. They are given between four to eight questions and the students are to make choices and write essays based on the chosen questions.

Questions from 1995 to 1998 were chosen for this study. These questions were analysed to find out whether students have been tested on their critical thinking skills. These questions would be analysed according to the framework of Marzano (1992). He offers an instructional framework of organizing learning outcomes into five major categories. Each of these categories represents a type of thinking that is important for successful learning.

The framework of Dimension of Learning as outlined by Marzano (1992) is as follows:
Dimension 1: Positive Attitude and Perceptions about learning.

Dimension 2: Acquiring and integrating knowledge.
  - Declaration Knowledge
  - Procedural Knowledge

Dimension 3: Extending and Refining Knowledge.
  - Comparing
  - Classifying
  - Making induction
  - Making deductions
  - Analysing errors
  - Creating and analysing support
  - Analysing perspectives
  - Abstracting

Dimension 4: Using knowledge meaningfully.
  - Decision making
  - Investigation
  - Experimental inquiry
  - Problem solving
  - Invention

Productive Habits and Mind.
  - Being clear and seeking clarity
  - Being open-minded
  - Restraining impulsivity
- Being aware of your own thinking
- Evaluating the effectiveness of your actions
- Pushing the limits of your knowledge and activities
- Engaging intensely in the tasks even when answers or solutions are not immediately apparent.

Essay items can effectively assess both knowledge and reasoning skills. It is generally understood that essays can tap complex thinking by requiring students to organize and integrate information, interpret information, give arguments, give explanations, evaluate the merit of ideas and conduct other types of reasoning. Although objective items are clearly superior for making recall knowledge, the essay, as an extension of the short-answer format is an excellent way to measure understanding and mastery of complex information, such as how students explain procedures or put together many discrete facts into a meaningful whole.

The major advantage of using essay questions is that complex thinking and reasoning skills can be assessed. Essays motivate better study habits and provide students with flexibility in how they wish to respond. Written responses allow one to evaluate the ability of students to communicate their reasoning.

The major disadvantage of essay items is related to scoring students’ responses. Reading and scoring answers is very time consuming, especially when one has to give immediate and meaningful feedback to the students.
3.4.3.1 WS Paper 1995 (Refer Appendix C)

In this paper, there is a total of twelve questions and students are required to answer three questions only.

Question 1 requires candidates to examine the importance of trade groupings in world trade. Students would have to use the skills of making deductions from existing trade groupings and the extent to which these trade groupings have played their role in world trade.

Question 2 requires some form of discussion based on the increasing world population in relation to limited resources. Here, candidates would be able to make some comparisons based on an existing situation and suggest ways to solve the mentioned problem.

Question 3 is to evaluate the rationale of the Malaysian 'Look East Policy' (1982). In this question candidates are required to make some decisions and analyse the perspectives of this policy.

Question 4 requires the candidates to prepare a seminar paper highlighting one aspect of environmental problems in Malaysia. In this context, students are again required to find solutions to an existing environmental issue.
Question 5 asks candidates if they agree that economic forces exert the strongest influence on the mobility decisions of people in the Third World. This question requires candidates to make deductions and investigate the existing situations, before they arrive at some kind of agreement.

Question 6 provides a situation whereby the candidate is required to advise a client on the setting up of a high-tech industry in this country. Before providing the required advice, the candidate would have to analyse and make deductions and support with relevant examples, in order to convince someone to set up a factory.

Question 7 is to discuss the changing trend of the female labour force in Malaysia that has shifted from a concentration of subsistence rural economy to greater involvement in the urban industrial sector. This question demands the candidate to analyse the situation and make some deductions.

Question 8 is to discuss how the traditional family in Malaysia has been affected by rapid modernization. This question too, requires the candidate to investigate the existing situation and provide suggestions.

Question 9 is a reaction to a statement that appeared in the editorial column of 'The Times' of London. In this question, the candidate is required to analyse the situation and evaluate the extent to which the statement was 'far-reaching and courageous'.
Question 10 is to justify the controversy, whether one is a terrorist as mentioned in the mass media or a freedom fighter as envisioned by the person. This question needs one to make the distinction between a freedom fighter and a terrorist.

Question 11 is to discuss a paradox of the modern world, where there exists, on the one hand, information explosion through computer technology, and on the other, the restrictions imposed by the government towards access to information. This question expects the candidate to be able to make comparisons and also to analyse the existing situation.

Question 12 is to analyse and make a stand on a controversial statement that says peace and security cannot be won with the barrel of a gun. In this question the candidate has either to agree or disagree with the statement.

3.4.3.2 WS Paper 2 1996 (Refer Appendix C)

The 1996 WS Paper 2 consists of six questions. Candidates are required to answer all six questions.

Question 1 is to compare and contrast the contributions made by two well-known personalities towards achieving independence in their respective countries. This question requires candidates to make comparisons and support their answers with evidence of their contribution towards achieving independence.
Question 2 is to examine the extent to which freedom of speech should be allowed in a democratic system of government. In this question, the candidate has to investigate and examine situations whereby freedom of speech is allowed.

Question 3 is a discussion question related to the persistent and growing burden of poverty of women in relation to the circumstances that contribute to this particular issue. This question demands candidates to make a stand and mention reasons for or against the issue.

Question 4 is to evaluate a statement that video and computer games are an electronic curse. This is an argumentative piece of writing.

Question 5 is a question where candidates are required to justify the cause of minorities in certain countries fighting for separate states. This question demands candidates to cite reasons for their justification.

Question 6 is to assess the problems of health care in rural communities and to give effective measures to reduce these problems. This is a problem-solving type of question.
This paper consists of seven questions. The students are required to answer three questions.

Question 1 is a question to justify the formation of EAEC (East Asia Economic Caucus) by the Malaysian government. This question would demand the candidates to state reasons either in favour or otherwise.

Question 2 is about criticisms regarding the problems of the public health care system and how the privatization of public health could be an alternative. This question demands candidates to think and make a choice between public or private health care.

Question 3 is related to a statement that social stratification is a system by which a society ranks categories of people in hierarchy. Candidates are required to justify such stratifications.

Question 4 mentions that women play a less prominent role in managerial and professional positions. Candidates are required to justify this claim.

Question 5 is a discussion question that intends to find ways in which the standard of living could be raised.
Question 6 is to evaluate the statement that media can make or break a nation. In this question, candidates either agree or disagree with the statement.

Question 7 is an opinion question regarding the US strike against Iraq in September 1996. This question is an argumentative question whereby the candidates have to give reasons either in favour or otherwise. Thus, they have to analyse the situation in order to arrive at their decision.

3.4.3.4 WS Paper 1998 (Refer Appendix C)

The 1998 WS examination paper consists of seven questions and out of which candidates are required to answer any three questions.

Question 1 is a question to convince member countries to work together towards stabilizing world population at around 10.2 billion in the middle of the next century. The candidate, as the Secretary General of the United Nations, is required to write a speech. The question demands the candidate to make suggestions. Here, the candidate would have to cite reasons, so as to support the problem and make the necessary suggestions.

Question 2 requires the candidate to mention or justify for a replacement of GATT to the WTO in 1994.
Question 3 is a question related to the equal opportunities accorded to women. However, there are also those who consider women as a weaker sex. The question demands the candidates either to agree or disagree with this attitude of men.

Question 4 is about the rapid development of the electronic media that will cause newspapers to become obsolete. Candidates are asked the extent to which they agree with this view.

Question 5 is a discussion question that requires candidates to state whether industrialization is the answer to a country's economic progress.

Question 6 is based on a statement that the birth of Nationalism amongst people in a nation depends more on external than internal factors. Candidates are required to agree or disagree.

Question 7 is based on a prediction that rainforests are going to be extinct within 60 years and how this would affect life on earth. Candidates are required to highlight the seriousness of this situation and find solutions to overcome this problem.

In this section, WS Examination Papers from years 1995 to 1998 have been analysed. The total number of questions for the four years is thirty-two.
For the purpose of this study, dimensions three and four would be meaningful and relevant. Dimensions 1 and 2 are essential for early stages of cognition. Using the definitions and examples in Dimension 3 and 4, the WS examination questions from years 1995 to 1998 were evaluated. This is to see if the examination items measure or make an attempt to measure critical thinking skills.

3.4.4. Procedure

This section would describe the steps taken in administrating the questionnaires.

3.4.4.1: Pilot Study

A pilot study was carried out for the students' questionnaire. Twenty students were asked to respond to the questionnaire. It was during this session that some changes were made to the questionnaire. Changes made had to do with clarifying some aspects of the content and also to rectify ambiguity in the structures. On the whole the students did not have much difficulty in understanding the questions.

The recommendations made by the students were taken into consideration, and the questionnaire was based on these recommendations.

Two colleagues checked the tutors' questionnaire. Amendments were made where necessary before the study was carried out.
On completion of the pilot study and checking of the questionnaires, both these sets of questionnaires were typed and were ready for the study.

3.4.4.2: Administering the questionnaires

Eighty sets of questionnaires were given to the students. They were to respond and return them. However, 65 sets of the questionnaires were collected the following day from the students. The remaining 15 sets were not considered for this study because the respondents did not complete them and some even misplaced their questionnaires.

The tutors' questionnaires were given to eight colleagues, who had taught the WS course to the matriculation students. These tutors have more than two years of experience teaching this course. All of them managed to return the questionnaires fully completed.

3.4.5: Analysis of Data

The data collected have been analysed based on the research questions. The data was processed using frequency counts and averages.
Every item in the questionnaire was analysed using simple frequency counts and percentages. Two types of statistical techniques had been used to analyse the data, namely descriptive and inferential statistics.

Research questions one and two were analysed using descriptive statistics such as frequency and percentages. As for research question three, document analysis was carried out to determine the critical thinking elements that were present in the WS examination questions. Inferential statistics in the form of Pearson Product Moment correlation was carried out to determine whether there was any significant relationship between critical thinking ability and the score obtained by the respondents in the WS examination. The level of significance was set at $P < 0.05$. 