CHAPTER 4

ANALYSIS OF RESULTS

Introduction

In this chapter the analysis of the two sets of questionnaires, that is, the students’ and
the tutors’ questionnaires are presented. The first part of this chapter contains the analysis of
the questionnaires and the second part contains the analysis of documents, that is, the past
years’ WS examination questions. In the second part of this chapter too, the correlation of the
students’ perceptions of their critical thinking skills with their performance in the final
examination is presented.

4.1: Analysis of Findings: Students’ questionnaire (Refer Appendix D)

The students’ questionnaire was to find out answers to the first research question, that
is, students’ perceptions of their critical thinking skills, having undergone the critical
thinking skills course of the WS programme.

In this questionnaire fifty questions were asked regarding students’ perceptions of
critical thinking skills as well as their ability to perform certain specific skills. These skills
should be ideally achieved after having studied the WS course over a period of two years.
A five-point Likert Scale was used in both these sets of questionnaires:

VO: Very Often
O: Often
S: Sometimes
VR: Very Rarely
N: Never

The above abbreviations were used in all the following graphs to represent the data in the analysis. The scales of 'very often' and 'often' were considered as positive while 'very rarely' and 'never' were considered as negative.

Question 1 was regarding the ability to categorize the strengths of an issue.

![Figure 1: Students' ability to categorize the strengths of an issue](image)

68.8% of the respondents had indicated that they have the ability to categorize the strengths of an issue, while 6.2% did not possess this skill. This is a positive sign.
Question 2 was regarding the ability to categorize the weaknesses of an issue.

![Bar graph showing student ability to categorize weaknesses](image)

Figure 2: Students' ability to categorize weaknesses of an issue

61.5% of the respondents indicated that they have the ability to categorize weaknesses of an issue, while 6.2% did not have the skill. This is positive.

Question 3 was regarding the ability to consider other people's views.

![Bar graph showing student ability to consider others' views](image)

Figure 3: Students' ability to consider others' views

87.7% of the students had the ability to consider other people's views, while 1.5% did not have this skill. This is positive as the respondents did consider others' views.
Question 4 was regarding the skills of solving problems efficiently.

![Bar Chart: Students' skills of solving problems]

47.7% of the respondents had mastered the skill of solving problems efficiently. 49.2% had sometimes solved problems while 3.1% very rarely solved problems. Based on the figures, most of them have the skills of problem solving. This is an important ingredient in CT, as, if students can solve problems without much difficulty then, they would have put much thought before arriving at a decision.
Question 5 was regarding the ability to have an independent mind.

![Bar chart showing the ability to have an independent mind]

**Figure 5: Students' ability to have an independent mind**

83.1% of the respondents said that they have an independent mind, while 1.5% said otherwise. This is positive, because in order to be critical, one has to have a strong independent mind that is not influenced by any other external forces.

Question 6 was regarding the ability to communicate ideas clearly.

![Bar chart showing the ability to communicate ideas clearly]

**Figure 6: Students' ability to communicate ideas clearly**

61.6% of the respondents were able to communicate ideas clearly, while 3.1% did not have this skill. Communicating ideas clearly is an essential attribute in CT because it indicates one has analyzed and evaluated a problem before verbalising one's ideas.
Question 7 was regarding the ability to communicate feelings clearly.

![Bar chart showing percentage of students' ability to communicate feelings clearly.]

Figure 7: Students' ability to communicate feelings clearly

64.7% of the respondents were able to communicate their feelings clearly, while 4.5% were not able to perform the above. This figure further strengthens the assumption that students were rational when communicating with others.

Question 8 was regarding the ability to evaluate arguments critically.

![Bar chart showing percentage of students' ability to evaluate arguments critically.]

Figure 8: Students' ability to evaluate arguments critically

58.4% of the respondents were able to evaluate arguments, while 41.6% were able to do this sometimes. Both these scale adds up to 100%. This is very positive, because being able to evaluate arguments critically, is an important grain of CT skills. Critical thinkers
are people who are able to support their opinions with evidence, data, logical reasoning, and statistical measures and also look at a problem from multiple angles.

Question 9 was regarding the ability to draw mind maps with reference to an issue.

![Graph showing students' ability to draw mind maps](image)

**Figure 9: Students' ability to draw mind maps**

61.6% were able to draw mind maps, while 4.6% did not have this skill. Another 32.3% were able to draw mind maps sometimes. Judging from these figures, generally the students were able to generate ideas based on issues and draw their understanding using mind maps.

Question 10 was regarding the ability to gather relevant information.

![Graph showing students' ability to gather relevant information](image)

**Figure 10: Students' ability to gather relevant information**
71.8% of the respondents were able to gather relevant information, while 4.6% were not able to do this. Being able to gather relevant information is important because critical thinkers look at how others have approached the same question or problem and at the same time they also know when they need more relevant information.

Question 11 was regarding the ability to organize relevant information

![Bar Chart](image)

Figure 11: Students’ ability to organize relevant information

73.5% of the respondents were able to organize relevant information, while 3.1% were not able to do this. This indicates that critical thinkers are people who could analyze and synthesize assumptions, before making a conclusion.
Question 12 was regarding the ability to recognize a problem or an issue.

![Figure 12: Students’ ability to recognize a problem](image)

70.7% of the respondents were able to recognize a problem, while 4.6% were not. Being able to recognize a problem is important in CT because, before solving the problems meaningfully, one has to recognize and understand the nature and seriousness of a problem.

Question 13 was regarding the ability to define a problem or an issue.

![Figure 13: Students’ ability to define a problem](image)
66.2% of the respondents were able to define a problem while 6.2% were not able to do this. These figures are also related to the above issue in question 12 that is being able to recognize a problem.

Question 14 was regarding the ability to plan tactics for an argument or rebuttal.

![Bar Chart]

Figure 14: Students' ability to plan rebuttals

66.9% of the respondents were able to plan tactics for an argument while 6.2% were not able to do this. This is also an important skill that one should have, because in order to rebutt others' thoughts, one should put in much thinking.

Question 15 was regarding the ability to monitor their own performance.

![Bar Chart]

Figure 15: Students' ability to monitor their own performance
43.1% of the respondents were able to monitor their own performance, while 4.6% were not able to do this. Being able to monitor one’s own performance is important because, one is able to check and balance one’s action before making a decision or conclusion.

Question 16 was regarding the ability to revise plans or strategies to meet original goals.

![Figure 16: Students' ability to revise plans](image)

47.7% of the respondents were able to revise plans to meet original goals while 13.8% were not able to do this. This indicates that a critical thinker is flexible and is able to adapt to changes around without much difficulty.

Question 17 was regarding the ability to evaluate performance.

![Figure 17: Students' ability to evaluate performance](image)

50.0% of the respondents were able to evaluate performance, while 13.8% were not able to
do this. This is important too because one is able to monitor one’s performance without depending on others.

Question 18 was regarding the ability to improve both oral and written communication.

![Bar Chart](image)

Figure 18: Students' ability to improve both oral and written communication

70.8% of the respondents had improved both oral and written communication through critical thinking, while 3.1% had not. Communication is an important feature of CT.

Question 19 was regarding the ability to ask questions to clarify an issue or problem.

![Bar Chart](image)

Figure 19: Students' ability to ask questions to seek clarification
58.4% of the respondents were able to seek clarification, while 6.2% were not able to do this. Seeking clarification is important in CT, because it makes one doubly sure of the issues and also to confirm one's thoughts.

Question 20 was regarding the ability to use previous knowledge or experiences in discussion.

Figure 20: Students' ability to use previous knowledge

72.3% of the respondents were able to use previous knowledge or experiences in their discussions, while 4.6% very rarely did this. Critical thinkers were able to relate their previous experiences and make changes in accordance to present situations.
Question 21 was regarding the ability to analyze the problems or issues into their specific categories.

![Chart showing analysis ability]  

Figure 21: Students' ability to analyze problems into categories

68.9% of the respondents were able to analyse the problems into their specific categories while 3.1% were not able to do this. This is a positive attribute, because one is able to define a problem objectively.

Question 22 was regarding the ability to search systematically for data in the library.

![Chart showing systematic search ability]  

Figure 22: Students' ability to search for information systematically

60.0% of the respondents were able to do library search systematically, while 4.6% were not able to do this. Searching for information systematically shows that one is an organized person and this is a positive attribute in critical thinking.
Question 23 was regarding the ability to check data with other resource materials.

Figure 23: Students' ability to check data from other resources

50.8% of the respondents were often able to check data from other resource materials. This is important because checking data with other resources is necessary before arriving at a conclusion.

Question 24 was regarding the ability to translate problems into a task with clear objectives.

Figure 24: Students' ability to translate problems into a task

38.5% of the respondents were able to translate problems into tasks, while 55.4% respondents could do this sometimes. These figures indicate a negative tendency. Perhaps, this was due to the inability of the respondents to operationalize a problem successfully at that stage.
Question 25 was regarding the ability to select and organize relevant information.

![Figure 25: Students' ability to select and organize relevant information](image)

70.4% of the respondents were able to select and organize relevant information. This indicates that critical thinkers are able to discard irrelevant information.

Question 26 was regarding the ability to read widely on current events.

![Figure 26: Students' ability to read widely on current issues](image)

69.2% of the respondents were able to read widely on current events, while 6.2% were not able to do this. Reading widely with a critical eye on current events is important for one to stay up-to-date and be selective on latest information.
Question 27 was regarding the ability to speak up one's mind during class discussions.

59.5% of the respondents were able to speak up while 6.2% were not able to do this. This indicates that the respondents were able to criticize to some extent.

Question 28 was regarding the ability to work in pairs and groups.

80.0% of the respondents were able to work in pairs and groups. This is a positive feature, because before deciding on something crucial, the respondents ponder over seriously and take this opportunity to gather other's opinions and ideas before forming their own conclusions.
Question 29 was regarding the ability to participate actively in group discussions.

![Bar chart for question 29](image)

Figure 29: Students' ability to participate actively in discussions

83.1% of the respondents were able to participate actively in group discussions. This is a positive sign because ideas could be generated during a discussion.

Question 30 was regarding the ability to disagree with friends without being emotional.

![Bar chart for question 30](image)

Figure 30: Students' ability to disagree

69.2% were able to disagree with others without being emotional, while 4.6% were not able to do this. This is a positive trend, because if one is emotional, there is a possibility that one's thinking could be muddled and not focussed.
Question 31 was regarding the ability to identify errors in tutor’s arguments.

![Figure 31: Students' ability to identify errors in tutors' arguments](image)

36.9% of the respondents were not able to identify errors in tutors’ arguments. The figures show a negative tendency. There are two possible reasons for this. Firstly, respect for elders, in this case the tutors, and secondly, it reflects the tutors’ maturity of thought.

Question 32 was regarding the ability to identify errors in tutor’s comments.

![Figure 32: Students' ability to identify errors in tutors' comments](image)

40.0% of the respondents were able to identify errors in tutors’ comments while 43.1% sometimes could do this and 13.8% were not able to do this. The figures show a positive trend as compared to the earlier figures in Question 31. This could be because, students could evaluate the comments made by the tutors.
Question 33 was regarding the ability to contribute ideas to fellow friends during presentations.

80.8% of the respondents were able to contribute ideas to fellow friends during presentations while 3.1% were not able to do this. This is a positive sign because respondents were able to discuss issues in a transparent manner.

Question 34 was regarding the ability to participate in class debates.

44.7% of the respondents were able to participate in class debates. 33.8% of them sometimes took part, while 16.9% very rarely took part in class debates. The figures are
not very positive. This is perhaps due to the lack of debating skills among the respondents.

Question 35 was regarding the ability to participate in class forums.

49.2% of the respondents were able to participate in class forums, while 21.5% of them were not able to participate. The figure is slightly more than the data in Question 34. This could be because of the differing conventions in debates and forums.

Question 36 was regarding the ability to put ideas or thoughts in the form of graphics and posters.
50.8% of the respondents were able to put ideas in the form of graphics while 16.9% were not able to do this. This involves, drawing skills, which could be lacking in some students.

Question 37 was regarding the ability to criticize constructively without hurting one’s feelings.

![Bar chart showing the percentage of students' ability to criticize constructively.]

Figure 37: Students' ability to criticize constructively

59.3% of the respondents were able to criticize constructively without hurting one’s feelings. 40.0% were able to do this sometimes and 6.2% were not able to criticize constructively. Generally, this is quite natural, because the question of hurting or not hurting one’s feelings depends on the personality of the speaker. It is extremely challenging to mention something unfavourable diplomatically.
Question 38 was regarding the ability to explain issues critically.

![Bar chart showing the percentage of students' ability to explain issues critically]

Figure 38: Students' ability to explain issues critically

53.8% of the respondents were able to explain issues critically while 40.0% could do this sometimes and 6.2% were not able to do this. The data indicates that the respondents have the skills of explaining issues critically.

Question 39 was regarding the ability to justify one's stand or issues.

![Bar chart showing the percentage of students' ability to justify their stand]

Figure 39: Students' ability to justify their stand

73.9% of the respondents were able to justify one's stand on issues, while 4.6% of them were not able to do this. Providing a justification for a course of action is an important element in CT skills. Before arriving at a point of justification, one is required to think thoroughly.
Question 40 was regarding the ability to compare the cause and effect of events in terms of social issues.

![Chart showing comparison of ability to compare cause and effect of social issues]

Figure 40: Students' ability to compare cause and effect of social issues

70.8% of the respondents were able to compare the cause and effect of events in relation to social issues while, 3.1% were not able to do this. The above data is positive in favour of the acquisition CT skills. This is because being able to visualize the differences in a particular issue is an important characteristic of a critical thinker.

Question 41 was regarding the ability to compare the cause and effect of events in terms of economic issues.

![Chart showing comparison of ability to compare cause and effect of economic issues]

Figure 41: Students' ability to compare cause and effect of economic issues
47.7% of the respondents were able to compare the cause and effect of economic issues while 6.2% were not able to do this. There is a drop in this data as compared to the data in Question 40. Perhaps, in this case one should also have sound background knowledge of economic issues. Considering the fact that the respondents are school certificate holders, their exposure to economic reading may be limited.

Question 42 was regarding the ability to compare the cause and effect of events in terms of political issues.

![Chart showing percentage of respondents able to compare cause and effect of political issues]

Figure 42: Students' ability to compare cause and effect of political issues

43.1% of the respondents were able to compare the cause and effect of events in terms of political issues while 8.7% of them lacked in this skill. The data does not indicate a positive trend. This may be due to respondents' lack of previous knowledge on political issues.
Question 43 was regarding the ability to compare the cause and effect of events in terms of cultural issues.

![Graph showing comparison of cause and effect](Image)

Figure 43: Students' ability to compare cause and effect of cultural issues

64.6% of the respondents were able to compare cause and effect of cultural issues while 4.6% were not able to do this. The data shows an upward positive trend. In this case perhaps the respondents are aware and understand the different and diverse cultures of their country.

Question 44 was regarding the ability to predict outcomes.

![Graph showing prediction outcomes](Image)

Figure 44: Students' ability to predict outcomes

67.6% of the respondents were able to predict outcomes while 3.0% were not able to do this. This is a positive sign, because in CT one is able to recognize patterns and provide a
way to use these patterns to solve a problem.

Question 45 was regarding the ability to draw conclusions from situations.

![Bar chart](image)

Figure 45: Students’ ability to draw conclusions

75.4% of the respondents were able to draw conclusions from situations while 3.1% were not able to do this. This is a positive trend in CT because, before one arrives at a conclusion, one has to think thoroughly.

Question 46 was regarding the ability to evaluate the credibility of arguments.

![Bar chart](image)

Figure 46: Students’ ability to evaluate credibility of arguments

55.4% of the respondents were able to evaluate the credibility of arguments, while 3.1% were not able to do this. This is a positive trend, because if one is able to evaluate the
credibility of others’ arguments, one should be able to detect preconceptions, bias and values present in the arguments.

Question 47 was regarding the ability to evaluate the significance of arguments.

![Figure 47: Students' ability to evaluate the significance of arguments](image)

57.0% of the respondents were able to evaluate the significance of arguments while 3.0% were not able to do this. This is a positive trend because critical thinkers are able to view at how others could have approached the same problem.

Question 48 was regarding the ability to evaluate the credibility of reports and other printed materials such as magazines, newspapers, Internet etc.

![Figure 48: Students' ability to evaluate reports etc.](image)
61.5% of the respondents were able to evaluate the credibility of printed media while 4.6% were not able to do this. This data is slightly more than that of Question 46 because, printed media gives one a better opportunity to comprehend an issue rather than arguments which are generally verbal discourse.

Question 49 was regarding the ability to react without much thinking.

![Bar chart](image)

**Figure 49: Students' ability to react without thinking**

26.2% of the respondents reacted without much thinking while 26.4% did not do this. This is not a positive trend towards critical thinking, because one has to analyse, synthesize and evaluate information before arriving at a conclusion.
Question 50 was regarding the ability to evaluate the effectiveness of one’s actions.

40.0% were able to evaluate the effectiveness of one’s actions, while 12.3% were not able to do this. This is in a way positive because one is able to do some self-evaluation of one’s own course of actions and thoughts.

Some of the questions in the students’ questionnaire are discussed in the following part. Item 8 was to find out if students had the ability to evaluate arguments critically. The findings showed that 58.4% of them could evaluate most of the time and 41.6%, sometimes. This is a positive trend, because the majority of them have the potential of evaluating arguments critically. The findings of Item 8 in a way correlates with the results of Item 9, whereby 93.8% of the students have the ability to draw mind maps based on issues. Once again, this is positive because being able to evaluate and also to consider all the different aspects of an issue are vital in nurturing a critical mind.

In item 37, 53.9% of the students were able to criticize constructively without hurting the other person’s feelings. 6.2% of the students said that they rarely did the above. This
indicates generally, the students were rational and were not emotional, when they criticize others.

In item 38, 53.8% of the students were able to explain issues critically while 4.6% felt they were unable to do so. Once again the students possessed the skills of explaining issues with a critical eye.

In item 39, 73.9% of the students were able to justify their stand on issues presented to them. This is quite an interesting observation because, most of them were able to come to a conclusion, after having thought about the issues very seriously.

In item 40, 70.8% of the students were able to compare the cause and effect of any event in terms of social issues. The percentage showed that students are generally above average and were able to identify the reasons for a certain problem.

Question 49 in the students’ questionnaire was to find out if students reacted without much thinking. The result showed that 47.4% sometimes reacted without much thinking. On the contrary 26.1% often thought or were hesitant before reacting.

The responses from the students in a way did not show exactly whether the course was supportive to the development of CT skills among the students. This was because the questionnaire was a self-assessment of the students perceived knowledge of CT skills. Their perceptions were correlated with their WS examination results. However, with reference to
the strategies adopted by the students, the course structure may have provided the parameters for the students to develop their critical thinking. Warnick et al (1994) have mentioned that CT involves the ability to explore a problem, question a situation and arrive at a solution in order to justify one’s position. This would, however, be done, after one has integrated all the available information. In this context, in order for students to arrive at a solution they would have to identify the strengths and weaknesses of an issue and only after having done that, would the students bravely justify their claim regarding an issue.

4.2: Analysis of results: Tutors’ questionnaire (Refer Appendix E)

The tutors’ questionnaire was to find out answers to the second research question that is whether the strategies employed by the tutors during this course had contributed to the development of critical thinking skills among the students.

This questionnaire was sub-divided into three sections. Section A discussed strategies adopted by tutors, while section B focussed on group work. Finally, section C discussed the role of resource materials in WS.
4.2.1: Section A: Strategies

Question 1 was to find out if students were given a range of opportunities to think through and solve problems.

![Figure 51: Opportunities given to students to think and solve problems](image)

100.0% of the tutors gave a range of opportunities to students for thinking through and solving problems.

Question 2 was to find out if students were presented with tasks that need to be formulated as problems.

![Figure 52: Presentation of tasks as problems](image)

80.0% of the tutors presented tasks that required students to formulate them as problems.
Question 3 was to find out if students were told the underlying issues to a problem.

![Graph showing underlying issues to a problem](image)

Figure 53: Statement of underlying issues to a problem

20.0% of the tutors felt that they had conveyed to the students the underlying issues to a problem; 80.0% of them sometimes did this.

The tutors gave students the opportunity to identify the underlying problems themselves.

Question 4 was to find out if tutors asked students to decide on a problem.

![Graph showing decision opportunity](image)

Figure 54: Opportunity to decide on a problem

40.0% of tutors gave students the opportunity to decide on a problem while 10.0% very rarely did this.
Question 5 was to find out if students were encouraged to look at resource materials critically.

Figure 55: Encouragement to look at resource materials critically

100.0% of the tutors encouraged students to look at resource materials critically. This is an important strategy in CT.

Question 6 was to find out if students were encouraged to plan their work.

Figure 56: Encouragement to plan work

90.0% of the tutors encouraged students to plan their work. This strategy is meaningful in CT, because tutors provide the avenue for planning, and this is vital to decision making.
Question 7 was to find out if students were asked to evaluate their strategies.

![Bar graph showing evaluation of strategies](image)

Figure 57: Students' evaluation of their strategies

70.0% of the tutors often requested the students to evaluate their own strategies. This strategy proposes to sharpen students thinking.

Question 8 was to find out if students were asked to evaluate evidence from text materials.

![Bar graph showing evaluation of evidence](image)

Figure 58: Students' evaluation of evidence

90.0% of the tutors often requested their students to evaluate evidence from text materials. This strategy is important because it gives ample practice for students to read texts critically.
Question 9 was to find out if students were given help by tutors to look for strengths and weaknesses of an issue.

![Bar Chart](image)

Figure 59: Help given to students in identifying strengths and weaknesses of an issue

80.0% of the tutors gave some form of guidance in trying to locate strengths and weaknesses of an issue. Some form of input is important, without which, one may find it difficult to start off the process of thinking.

Question 10 was to find out if students were asked to make judgements critically.

![Bar Chart](image)

Figure 60: Enabling students to make judgements critically

90.0% of the tutors asked students to make judgements critically. This is an important strategy for one to sharpen one's thinking.
Question 11 was to find out if students were asked to reflect on what they had achieved.

![Graph showing percentage of students engaged in reflection]

Figure 61: Enabling students to reflect on their achievements

80.0% of the tutors provided the time to reflect on the students' achievements. This is important, because in reflective thinking, it gives one an opportunity to improve one's course of action.

Question 12 was to find out if students were given the opportunity to communicate their ideas and experiences.

![Graph showing percentage of students engaged in communication]

Figure 62: Opportunities for communication

100.0% of the tutors gave the opportunity to students to communicate their ideas and experiences. This is an important strategy in teaching WS because communication is vital, in order to understand each other better as a group.
Question 13 was to find out if students were encouraged to listen to each other.

Figure 63: Encouragement to listen to each other

All the tutors encouraged their students to listen to each other. This is important, because without listening to one another, students may not comprehend the issue satisfactorily.

Question 14 was to find out if students were encouraged to seek clarification.

Figure 64: Encouragement to seek clarification

All the tutors encouraged students to seek clarification. This is an important skill in CT, because it allows one to check one’s understanding of a specific issue.
4.2.2: Section B: Group Work / Discussion

Question 1 was to find out if students were given time for discussions.

![Figure 65: Giving students time for discussions](image)

All the tutors gave ample time for discussions. Discussions amongst peers is important, before coming up with a final solution to a problem.

Question 2 was to find out if students were called upon to participate in discussions.

![Figure 66: Enabling students to participate in discussions](image)

70.0% of the tutors very often called upon their students to participate in discussions. This acts as a further encouragement for the students to think thoroughly.
Question 3 was to find out if tutors had drawn from students’ personal experiences.

Figure 67: Drawing upon the personal experiences of students

90.0% of the tutors would try to use students’ personal experiences to draw some form of conclusions. This is important, because the discussions become meaningful and motivate learners to participate willingly in discussions.

Question 4 was to find out if students were given opportunities to cooperate with one another.

Figure 68: Opportunities for cooperation

All the tutors gave opportunities for students to cooperate with one another. Cooperation amongst group members is vital, in order to develop a friendly atmosphere, during a serious discussion.
Question 5 was to find out if students were given chances to develop their social skills.

![Bar Chart](image)

Figure 69: Chances for students to develop social skills

90.0% of the tutors gave chances for students to develop their social skills. This is important, because it helps to build one’s confidence.

Question 6 was to find out if tutors handled misunderstanding among students positively.

![Bar Chart](image)

Figure 70: Handling of students’ misunderstandings positively

90.0% of the tutors handled misunderstanding among students positively. This is to build rapport amongst tutors and students and also to build confidence among students.
Question 7 was to find out if tutors handled misunderstanding among students constructively.

![Graph showing handling of students' misunderstandings constructively](image1)

Figure 71: Handling of students' misunderstandings constructively

All the tutors handled misunderstanding among students by providing constructive criticisms. This is important in the process of teaching thinking skills because negative criticism will create negative repercussions amongst learners.

Question 8 was to find out if students were given a wide range of problem-solving tasks during discussions.

![Graph showing provision of problem-solving tasks by tutors](image2)

Figure 72: Provision of problem-solving tasks by tutors

90.0% of the tutors often provided a range of problem-solving tasks. This is an important strategy in developing critical thinking amongst learners.
Question 9 was to find out if tutors included open-ended tasks, which had many alternatives.

![Bar chart showing inclusion of open-ended tasks]

Figure 73: Inclusion of open-ended tasks

80.0% of the tutors provided tasks, which had many alternatives. This is to give an opportunity to students to be selective when making decisions.

Question 10 was to find out if tutors emphasised on small group work amongst students.

![Bar chart showing emphasis on small group work]

Figure 74: Emphasis on small group work

90.0% of the tutors emphasised on small group work. This was to ensure that team members participate actively and also gave the chance for everyone in the group to contribute to the discussions.
Question 11 was to find out if tutors developed students’ oral skills during the course.

![Graph showing development of students' oral skills.]

Figure 75: Development of students’ oral skills

90.0% of the tutors helped to develop students’ oral skills during the course. This is vital because it allows one to articulate and present one’s facts and opinions in a meaningful manner.

Question 12 was to find out if tutors indicated to their students that they were not necessarily looking for correct answers.

![Graph showing tutors feedback to students' answers.]

Figure 76: Tutors feedback to students’ answers

All the tutors had indicated to their students that they were not expecting correct answers. This is important because in teaching CT the process one goes through in thinking is as important as the final decision.
Question 13 was to find out if aspects from the topic of discussion were integrated.

![Figure 77: Integration of aspects from topics of discussion](image)

87.5% of the tutors had integrated aspects from topics or issues during discussions. This is an important strategy, because the tutor as facilitator constantly helps students to focus on an issue with minimal distractions.

Question 14 was to find out if tutors summarized aspects from the topic of discussion.

![Figure 78: Tutors' summary of a topic](image)

All the tutors summarized aspects from the topics of discussion. This practice is important in classroom teaching, because it provides a scope for learners to reflect and is also a spring board to continue further.
Question 15 was to find out if students were given a chance to see their peers' written assignments.

Figure 79: Chance to see peers' written assignments

10.0% of the tutors rarely gave the chance to see peers' written assignments, while 60.0% of them sometimes did this. Perhaps tutors considered one's written assignments confidential, as marks would have been awarded.

Question 16 was to find out if tutors provoked students to talk by creating issues from discussions.

Figure 80: Provoking students to talk

80.0% of the tutors provoked students to talk. This is important as tutors could start–off or challenge students to think about a particular issue.
Question 17 was to find out if tutors monitored oral discussions closely.

![Bar chart showing monitoring of oral discussions]

Figure 81: Monitoring oral discussions

80.0% of the tutors monitored oral discussions. This is a good strategy because, monitoring discussions allows the tutors to think along with the students and also to constantly check the students' course of reasoning.

Question 18 was to find out if students were encouraged to plan their answers before presenting them.

![Bar chart showing encouragement to plan answers]

Figure 82: Encouragement to plan answers

90.0% of the tutors encouraged students to plan their answers before presenting them. This gave an opportunity for students to scrutinize their work before presenting it to others.
4.2.3: Section C: Resource Materials

Question 1 was to find out if students were provided with visuals, such as pictures, cartoons to stimulate students’ ideas.

![Figure 83: Provision of visual aids](image)

80.0% of the tutors had provided some form of visual aids to stimulate students’ ideas. This strategy is to encourage students to think an issue thoroughly before forming some kind of conclusion.

Question 2 was to find out if tutors prepared their own resource materials.

![Figure 84: Preparation of materials by tutors](image)
60.0% of the tutors prepared their own resources while 40.0% sometimes did this. This generally indicates that the tutors did prepare some resource materials to enhance their teaching strategies.

Question 3 was to find out if tutors adapted and adopted resource materials from other sources.

![Figure 85: Adapting and adopting of materials](image)

90.0% of the tutors adapted and adopted resource materials from other sources. This is an appropriate move to meet the needs of the learners.

Question 4 was to find out if students were encouraged to read widely.

![Figure 86: Encouragement to read widely](image)
100.0% of the tutors had encouraged their students to read widely. Reading widely is one way to encourage students to have substantial content. Hence, a well-read person is able to contribute in discussions.

Question 5 was to find out if students were encouraged to do library research.

Figure 87: Encouragement to do library research

100.0% of the tutors had encouraged students to do library research. This step was to enhance students' knowledge on certain issues. Again this was vital for providing enough content for discussion.

Question 6 was to find out if students were asked to bring articles and materials from other sources for discussions.

Figure 88: Bringing of own materials
100.0% of the tutors had encouraged students to bring articles and materials for class discussion. This strategy was to get students involved in their learning process and also to have a sense of partnership in the course.

Question 7 was to find out if tutors discussed excellent pieces of work in class.

![Figure 89: Discussion of excellent work](image)

60.0% of the tutors often discussed excellent pieces of work in class. This was a strategy to motivate other students who did not perform well in their daily class work.

Question 8 was to find out if students were encouraged to keep a portfolio.

![Figure 90: Encouragement to keep portfolios](image)

90.0% of the tutors encouraged students to keep portfolios. This was to keep a record of
their learning and also to collect materials that were related to the issues discussed during the WS lessons.

Question 9 was to find out if tutors discussed past test and examination papers.

![Figure 91: Discussion of previous test papers](image)

40.0% of the tutors discussed past test and examination papers. This was not carried by all the tutors. Some say it was not necessary to do this, as they felt that past examination questions would not be repeated and was considered a waste of time.

Question 10 was to find out if tutors used newspaper and magazine articles for discussion.

![Figure 92: Use of newspapers and magazines for discussion](image)

100.0% of the tutors used articles from newspapers and magazines for discussions. This
indicates that the tutors kept the students' minds focussed on current issues and materials to enhance critical thinking.

Question 11 was to find out if tutors provided correct answers for students' discussion.

Only 20.0% of the tutors provided correct answers for students' discussion. This indicates that tutors had accepted logical answers from students. This is in a way a positive step because in CT, there is no one particular or a definite answer to an issue.

Question 12 was to find out if students were provided with model answers for examinations.
50.0% of the tutors did not provide model answers as they felt this would stifle students' own thinking process.

The second research question had to do with the strategies, that is, whether the strategies that were used by the tutors to teach WS did contribute to the development of CT skills in a student. Data for this issue would be taken from both students' and tutors' questionnaires. The first part to the question would be based on the students' views and the second part would reflect tutors' views. Question 25 from the students' questionnaire required students to select and organize relevant information. 70.4% of the students believed that they were able to do this activity very often. This indicated that students possessed the skills of reading critically and were able to compile information satisfactorily. The next issue was regarding the ability to read widely on current events and about 69.2% of the students were able to do this very often. 61.5% of the students were able to give their opinions during class discussions. Referring to the above issues, more than 50% of the students were able to adopt strategies that could enhance their critical thinking skills. The tutors were asked about the students' performance during the classes and they said that the students were generally critical and were able to contribute their ideas and views during discussions.

According to Anderson 1981 and Coffman 1980, in teaching students to think, the emphasis is not on how many answers students know, but on how students behave when they do not know. They further mention that a critical characteristic of intellectual ability, is knowing how to act on information and not just acquire it. Thus, one is interested in observing how students produce rather than reproduce knowledge. The comments made by
the above personalities in a way could be achieved through the strategies adopted by students by reading widely, and from this reading, they are to select relevant information and, finally produce their own thoughts based on their critical reading and intelligent discussions.

The second part to this issue of how tutors' strategies had helped in the development of CT among students was based on the views of tutors.

Question 1 of the tutors' questionnaire was to find out if students were given a range of opportunities to think and solve problems. 100% of the respondents mentioned that they do this very often. The next question was to find out if students were presented with tasks as problems to be formulated and 80% of the respondents said they did this often. Subsequently, about 80% said that they sometimes pointed out to the students the problems related to an issue. More often students had to identify the problems by themselves. Hence, this helps students to think critically and logically before arriving at a solution to a problem. Question 5 was to find if students were encouraged to look at resource materials critically. 100% of the respondents did this often.

With reference to item 10 of the tutors' questionnaire, about 90% of the respondents mentioned that they gave students the opportunities to make judgements critically. Item 11 from the same questionnaire was to find out if tutors asked students to reflect on what they had achieved, and 80% of them mentioned that they encouraged students to reflect.
The evidence showed that the course had in a small way encouraged critical thinking skills among these students. It is hoped that students did benefit from the steps taken by tutors in order to achieve their teaching and learning objectives. Some of the steps taken by tutors were to give students the opportunities to write essays. According to Clarke and Birddle (1993), writing is the most powerful tool for the process of learning. As such, writing plays a prominent role in the teaching of CT. In students’ own writing, they can recognize their thought processes and amend these processes to better suit their aims. With thought represented in physical form, tutors can help students to exert greater control over their own mental work.

4.3 Evaluation of World Studies Examination Questions

In this section, the evaluation of the WS Examination questions using the Dimension of Learning as outlined by Marzano, (1992) will be presented.

Examination questions selected from years 1995 to 1998 were evaluated using dimensions three and four of Marzano’s framework of learning. Both these dimensions are relevant and meaningful to see if the examination items test critical thinking. Fellow colleagues, who taught this course, validated the evaluation of these examination questions.

Dimensions 3: Extending and Refining Knowledge

3.1 Comparing

3.2 Classifying

3.3 Making inductions

3.4 Making deductions
3.5 Analysing errors
3.6 Creating and analysing support
3.7 Analysing perspectives
3.8 Abstracting

Dimension 4: Using Knowledge meaningfully
4.1 Decision making
4.2 Investigation
4.3 Experimental inquiry
4.4 Problem solving
4.5 Invention

Table 4.3.1: Analysis of 1995 WS Examination Questions

<table>
<thead>
<tr>
<th>Year</th>
<th>Questions</th>
<th>Framework 3</th>
<th>Framework 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>1. The twentieth century has seen the emergence of numerous trade groupings all over the world. Examine the importance of these groupings in world trade.</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. The world population problem is not just a matter of expanding numbers but also one of limited resources. Discuss.</td>
<td></td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>3. &quot;In 1982, the Mahathir administration introduced a new dimension to the Malaysian perspective of world affairs and natural development with the Look East Policy&quot; Evaluate the rationale of the Look East Policy and its contribution to economic development in Malaysia.</td>
<td></td>
<td>3.8 4.1</td>
</tr>
<tr>
<td></td>
<td>4. You are going to present a paper at a seminar highlighting one aspect of environmental(sic) in Malaysia. On preparing for this, consider whether pollution can be seen solely in national terms. Prepare your paper including concrete examples</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>3.4</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-----</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>5. Economic forces exert the strongest influence on the mobility decisions of people in the Third World. Do you agree?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Jang Yuan, a Korean, has approached you, a local consultant, for advice on setting up a high-tech industry in this country. Advice him on the choice of industry and other factors that he should consider when setting up the industry.</td>
<td>3.6</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>7. The pattern of the female labour force in Malaysia has shifted from a concentration on subsistence rural economy to a greater involvement in the urban industrial sector and the service sector. Discuss this changing trend over the last three decades.</td>
<td>3.4</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>8. Discuss how the traditional family in Malaysia has been affected by rapid modernisation. Project how your family might accommodate other changes in the near future.</td>
<td></td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>9. The editorial of 'The Times', London (12th October, 1945) saw the Malayan Union policy as a British scheme that was 'far-reaching and courageous'. As the editor of a local Malay newspaper at that time, write an editorial reacting to the above statement. (Your answer must be in ENGLISH)</td>
<td>3.4</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>10. You are regarded as a terrorist by the mass media. However, you have always considered yourself a freedom fighter. You get an opportunity to speak to a foreign journalist. Justify your cause. You may base your answer on any specific country.</td>
<td>3.6</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>11. 'A paradox of the modern world is that while computer technology and telecommunications have made spreading news and information easier, most governments have clamped down hard on people's right to know'. (Gala Peace Atlas, 126, 1998) Discuss the above statement, basing your answers on specific examples from the printed and broadcasting media.</td>
<td>3.1</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>12. 'Peace and security cannot be won at the barrel of a gun'. (Archbishop Desmond Tutu) To what extent do you agree with the above statement?</td>
<td>3.4</td>
<td>4.2</td>
<td></td>
</tr>
</tbody>
</table>
## Table 4.3.2: Analysis of 1996 WS Examination Questions

<table>
<thead>
<tr>
<th>Year</th>
<th>Questions</th>
<th>Framework 3</th>
<th>Framework 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>1. Compare and contrast the contributions made by Mahatma Gandhi and Tunku Abdul Rahman towards achieving independence in their respective countries.</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Examine the extent to what freedom of speech should be allowed in a democratic system of government.</td>
<td></td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>3. Discuss the impact of the persistent and growing burden of poverty on women in relation to the circumstances that contribute to this issue.</td>
<td>3.7</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>4. Video and computer games are an electronic curse. Evaluate this statement.</td>
<td>3.7</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>5. Recently minorities in certain countries are fighting for separate states of their own. Justify this cause.</td>
<td>3.6</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>6. Assess the problems of health care in rural communities and explain your suggested effective measures to reduce these problems.</td>
<td>3.7</td>
<td>4.4</td>
</tr>
</tbody>
</table>
### Table 4.3.3: Analysis of 1997 WS examination questions.

<table>
<thead>
<tr>
<th>Year</th>
<th>Questions</th>
<th>Framework 3</th>
<th>Framework 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>1. In a rare interview over Cable News Network Business Asia on the 26th of September 1996, Malaysia’s Prime Minister mentioned that “it (EAEC- East Asia Economic Caucus) is far from being dead” and “the Caucus is expected to be formed when the US stops saying no”. In line with this, discuss whether the formation of the EAEC is justified.</td>
<td>3.8</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td>2. With the rise of criticisms regarding the problems of the public health care system, do you think privatization of public health care is an alternative to a more efficient service?</td>
<td>3.4</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>3. Social stratification refers to a system by which a society ranks categories of people in a hierarchy. Clarify the statement above and discuss whether such stratification is justified.</td>
<td>3.4</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>4. Inspite of the progress made by women in society, they seem to play a less prominent role in managerial and other top ranking professional positions. Do you agree?</td>
<td>3.4</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>5. One of the customary objectives of an industrialization policy is to raise the standard of living. Discuss the ways in which the standard of living could be raised.</td>
<td>3.4</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>6. Media can make or break a nation. Evaluate this statement.</td>
<td>3.7</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td>7. The world reacted strongly to the US strike against Iraq in September 1996. What is your opinion of this particular event?</td>
<td>3.4</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.3.4: Analysis of 1998 WS examination questions.

<table>
<thead>
<tr>
<th>Year</th>
<th>Questions</th>
<th>Framework 3</th>
<th>Framework 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>1. As the Secretary General of the United Nations, your task is to convince member countries to work together towards stabilizing world population at around 10.2 billion in the middle of the next century. Write out your speech. You should suggest to control population growth.</td>
<td></td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>2. GATT was aimed at removing the barriers to international trade and it became effective in January 1948. However, in 1994 there was a need to have another organization to replace GATT and therefore WTO was formed. Justify the need for this change.</td>
<td>3.7</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>3. Overheard in the library, ‘I know women deserve the same rights and opportunities as men, but I still like to hold the door for them’. Is this attitude towards women acceptable today?</td>
<td></td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td>4. ‘The rapid development of electronic media will cause newspapers to become obsolete’. To what extent do you agree with this view?</td>
<td>3.7</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td>5. Is industrialisation the answer to a country’s economic progress? Discuss.</td>
<td>3.7</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td>6. ‘The birth of Nationalism amongst people in a nation depends more on external than internal factors’. Do you agree?</td>
<td>3.4</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>7. Rainforests are predicted to become extinct within 60 years. How will this affect life on earth and what steps can be taken to preserve the rainforests?</td>
<td>3.7</td>
<td>4.1</td>
</tr>
</tbody>
</table>

The analysis of the examination questions from 1995 to 1998 was carried out to examine to what extent the assessments of the WS course measured critical thinking skills. The analysis of the WS questions using Marzano’s dimensions 3 and 4, to a great extent shows that all the examination questions from 1995 to 1998 do fall into the above mentioned dimensions. This analysis was counter-checked by fellow colleagues in the teaching team.
The last research question was to find out whether there is any correlation between students’ perceptions of their critical thinking skills and their performance in the final exam. The 1998 WS Examination Paper was used for this purpose. The scores obtained by the students in answering that paper were correlated to the percentages obtained in the students’ questionnaire. The result showed that, there was a significant correlation between the students’ perception of whether they had acquired critical thinking skills during the world studies course and their performance in the 1998 WS final examination. (V: 0.330; P < 0.05).

Table 4.3.5: Table showing the Correlations.

<table>
<thead>
<tr>
<th></th>
<th>Exam marks</th>
<th>Critical thinking skill</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pearson Correlation</td>
<td>1.000</td>
</tr>
<tr>
<td>Exam marks</td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>65</td>
</tr>
<tr>
<td>Critical thinking skill</td>
<td>Pearson Correlation</td>
<td>.330**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.009</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>62</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed)

According to Meyers, (1986: 61) creating written assignments that encourage CT is a challenge because there are so few appropriate models. Problems and issues that require CT do not lend themselves to examination questions with simple or incorrect answers. In assessing CT abilities, it is often as important to know how a student arrived at a conclusion.
Assignments in CT should give students opportunities to puzzle over issues, to sort things out and to formulate their own independent judgements.

McPeck, (1990: 22-23) mentions that in CT testing, the five sub-abilities of CT should be tested and found in students' answers. The sub-abilities are: the ability to define a problem, the ability to select pertinent information for the solution of a problem, the ability to recognize stated and unstated assumptions, the ability to formulate and select relevant and promising hypothesis and finally the ability to draw valid conclusions and judge the validity of inferences. If the above sub-abilities are found in students' essays, they have to a certain extent achieved the objectives of a CT course.

In the context of the WS examination questions, all the questions have been written in a way, as to get students to think critically. In fact, the questions have generally been based on dimensions 3 and 4 of Marzano's framework. This was also agreed by all fellow colleagues who were in the WS teaching team.