**CHAPTER ONE**

## 1.0　Introduction

Thinking is the most fundamental of human being's abilities. It is impossible to initiate a meaningful communication without the ability to think, to reason, to understand and to organize our thoughts. Cognitive processing of information is essential in any form of communication be it spoken or written (Rosnani, 2010).

Critical thinking is an important skill that is needed to deal with various situations which are called upon planning, analyzing issues, making decisions and solving problems. Every day brings new and difficult challenges: how to solve an issue at work, what to do when our elderly parents can no longer care for themselves, how to deal with difficult people, and how to manage our investment or finances wisely. In most cases, successful problem solving and decision making skills require individuals to come up with solutions which are new and explicitly formulated so as to fit the particular problem or issue.

Decision making and problem solving skills are increasingly expected of employees. In recent years, employees are expected to carry out their assigned task indisputably. Since the revolution of communication technology and globalization, employers seek young professionals who are more advanced in critical thinking, reasoning, problem solving, and innovative and have strong communication skills (Graduate Employability Blueprint of Malaysia which runs from 2012 to 2017).

The importance placed on the need for Malaysian students to be good critical thinkers is partly attributed to the issue of high unemployment rate. Recent reports have shown that many graduates in Malaysia are finding difficulties in securing good jobs (The Star, October 2013). Employers have voiced their concern that many graduates do not meet their requirements as they lack critical thinking skills and are not adequately prepared for the challenges presented in the workplace. A study involving 280 Malaysian undergraduates revealed that the critical thinking ability of the undergraduates was much lower than that of their American counterparts (Rosyati A. R., & Rosna A. H., 2008). Many employers today are continually seeking employees who, apart from being highly qualified academically and technically, also possess critical thinking skills which are crucial to an employee's ability to work efficiently in a competitive environment (Cotton, 2001; DeLeon and Borchers, 1998). Ruggiero (2012) concludes that individuals who possess problem-solving and decision making skills are more flexible in adapting to the changes in the workforce and they have significant advantage over those who do not. For instance, they are also able to express and convey their thoughts with clarity and more confidence.

According to Shakir (2009), the development of 'soft skill' among Malaysian students is found to be lacking in three broad categories: interpersonal skills, personal attributes, problem solving and decision making skills. This is partly attributed to the 'rote learning' styles adopted by Malaysian students who have maintained the same studying patterns since young until adulthood (Ahmad, 1998). Many students resort to memorizing facts and figures in order to produce excellent grades in their examination and

this stunts the development of inquisitiveness, communicative competence and analytical skills in students (Shakir, 2009; Thang, 2003; Ng, 2008). Many developing countries in Asia are also facing this phenomenon (Wong, 2004; Kember, 2000).

The Ministry of Education in Malaysia has realized the need to improve students' thinking skills particularly at the primary and secondary school level. Hence, the education system has been undergoing reorganization which aims to implement and integrate critical thinking and problem solving skills into the school curriculum (Education Blueprint of Malaysia, 2013). In the nine goals stated in Malaysia's Vision 2020, one is to foster and develop a mature and democratic society. To meet this challenge, Malaysia would first require more research done to better understand the thinking skills used and exposed in classrooms. The various approaches in fostering these skills into students' lives also need to be observed so that they will be able to express their thoughts clearly and critically.

## 1.1    Statement of Problem

The result of student cognitive performance based on the Programme for International Student Assessment (PISA), which conducted a worldwide study in 2012 found that Malaysia ranked in the bottom third, 52 out of 65 participating countries (The Star, December 2013). A comparison of scores showed that 15 year-old students from Singapore, Hong Kong and Shanghai performed as though they had three or more years of schooling as compared to 15 year-olds from Malaysia. This implies that there is a mismatch between our

National Education Philosophy and the outcomes of Malaysian students' cognitive performance.

In a study carried out among Malaysian Chinese-speaking students, their critical thinking performance was a matter to be concerned with as they scored low marks in their English subject (Ku and Ho, 2010). In another similar study conducted by Alagozlu (2002) in Turkey also yielded similar results when the subjects were unable to communicate critically in English. These low marks may be the result of traditional instructional process which urges students to receive ready-made information without questioning. Students were not encouraged to think critically when using the English language to communicate and it is long researched that this may be due to the traditional method of teaching (Ku and Ho, 2010; and Alagozlu, 2002). It appears that students do not independently seek for answers or solutions to their queries through reasoning, debate or discussion. They prefer teachers to hand down answers.

Critical thinking as a skill influences all aspects of human life including education. The main reasons why not many students are critical thinkers is due to the lack of knowledge about the appropriate ways of employing critical thinking (Aliakbari, M, & Sadeghdaghighi, A (2011). A person who is a critical thinker 'can ask appropriate questions, gather relevant information, creatively sort out this information, reason logically and come to a reliable conclusion' (Schapersman, 1991:3). Therefore, knowing the degree of critical thinking ability in students' progress can help educators to improve their critical thinking potential.

For instance, if Malaysian students are critical, the economic status of Malaysia will be boosted when graduates emerging from the Malaysian education system are able to meet the expectations of prospective employers. The rate of employment in Malaysia will also improve significantly as graduates, who are effective critical thinkers, are able to communicate well and be at par with their counterparts. They will also be able to make substantial contributions to the nation when they become part of the human resource and whose goal is to become a developed nation. This will be realized when the economic prosperity of the country is sustained.

## 1.2    Aims

This study aims to fulfill the following objectives stated as follows:

1.3.1    To investigate the elements of critical thinking elements displayed in Malaysian teenagers' verbal argument.

1.3.2    To examine if there are differences between male and female students' verbal arguments.

1.3.3    To examine if there are similarities of Malaysian teenagers in expressing themselves in verbal arguments.

## 1.3　Research Questions

The research questions for this study are as follows:

1.4.1　What are the critical thinking elements displayed in Malaysian teenagers verbal arguments?

1.4.2　In what ways are male and female students similar or different from each other in using critical elements in verbal arguments?

## 1.4　Limitations of the Study

The scope of this study is not extensive enough to make the findings representative of all Malaysian learners. The data for this study was drawn from a small corpus of verbal data consisting of 16 students recorded on a video camera. The research samples selected for this study are Malaysian Chinese studying in a Chinese medium secondary school. This means that the findings could not be generalized to the other ethnic groups living in Malaysia. The 16 students selected are considered as proficient in their English. 13 of them had obtained an 'A' for English in their *Penilaian Menengah Rendah* and three of them managed to score a 'B'. The minimum proficiency level is to set a baseline among the students and to prevent their L2 limitations from impeding them to converse competently during the discussion.

## 1.5　Significance of the study

Students today are constantly being bombarded with a vast diversity of information through the multitude of media which are becoming more and more overwhelming today. Hence, there is a growing need to instill critical thinking as students are required to comprehend, to solve problems and make thoughtful decisions. However, due to the lack of research done in this area, this study has been undertaken with the hope that the findings will contribute to the body of research in the area of critical thinking and communication.

Analysis of the collected data may enable Malaysian educationists and even tertiary education bodies to better prepare their future students to greater competency in critical thinking, reasoning, problem solving and effective decision making. In addition, students could have the opportunity to incorporate higher level thinking with their English language learning which may develop their communicative competency and enhance their other basic language skills.

This study also seeks to provide more insight into the distinctive relation between critical thinking and gender. Therefore, this study is useful to determine if students are adequately equipped to apply these skills in the world beyond their school experience and whether there are significant differences between female and male students.

**1.6     Definition of Key Terms**

This study will be employing specific terms which are further defined.

1.6.1   Argument

An argument is a collection of claims whereby one is the conclusion the others are known as the premises, which are reasons or evidence to support, or convince that the conclusion is true (Epstein, 2002; Brown & Keeley, 1994).

1.6.2   Conclusion

A conclusion is a statement or series of statements in which speakers set out what they intends the opponents or audience to believe (Stapleton, 2001).

1.6.3   Claim

A claim is a statement whose truth is arguable, as it is an opinion, definitions, evaluations and proposals. It cannot be identified as an argument because it is not substantiated with valid or plausible reasons (Lau, 2001; Stapleton 2001).

### 1.6.4 Reason

Reasons refer to statements which are used to provide an explanations or rationales for why the claim should be believed. Reasons provide support to the conclusion. (Lau, 2001; Stapleton, 2001; Cortell 2005).

### 1.6.5 Evidence

Evidence refers to a statement or an assertion made to strengthen the argument. Evidence comes in many forms such as comparisons and analogies, statistics, research studies, citing authorities, personal experience, pointing out consequences, facts, logical explanations, and precisely defining words (Stapleton, 2001; Ramage and Bean, 1999).

### 1.6.6 Fallacy

A fallacy is a bad argument whereby it is intended to "trick" or persuade the audience or opponent into accepting a conclusion (Epstein, 2002). It is also known as invalid reasoning (Massey, 1981).

## 1.8    Summary

In summary, this research is conducted with the main objectives to investigate the elements of critical thinking in teenagers' verbal argument which was conducted in a classroom in an urban Chinese secondary school. The study is also undertaken to determine whether there are significant differences between male and female students in the way they express their arguments.

This chapter has presented the background of the study, starting with the statement of problem, the aims of the study, the research questions, the limitations, the significance and the definition of key terms used in this study. In the following chapter, we will look into reviews of literatures which are related to the research of this study.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.0    Introduction

This chapter reviews literature related to critical thinking and the different approaches to analysing critical thinking.    The literature also highlights other studies related to critical thinking.

## 2.1    Critical Thinking

In recent years, critical thinking (CT) has been recognized as an important cognitive skill for students to acquire in schools (Davidson & Dunham, 1997). The ability to think critically allows an individual to reason and analyse an issue better from different perspectives, make more concise decisions, tackle situations and solve new problems with lesser repercussions (Rajendran, 2004).

Many researchers have attempted to define critical thinking and there has been a variety of definitions provided by researchers and theorists from primarily three different academic disciplines.    Critical thinking has roots in philosophy, psychology and education. There is no clear or consensus definition of critical thinking as each has different perspectives of critical thinking (Lewis and Smith, 1993; Sternberg, 1986).

Critical thinking was first emphasized by Socrates, a Greek philosopher who discovered a method of asking questions and justifying claims rationally. Socrates probed the Athenians to have dialogues and ask questions in order to gain insights into any issue at hand and draw sensible conclusions from it. Socrates strongly believed that through a series of dialogues and questioning the mind will be trained to think systematically, reason, and trace implications broadly and deeply (Lai, 2011; Kirby and Goodpaster, 1995).

Contemporary researchers like Richard Paul (1992, p.9) define critical thinking as a 'disciplined, self-directed thinking which typifies the perfections of thinking suitable to a particular mode of thinking'. Paul made a distinction between 'strong sense' and 'weak sense' of critical thinking. According to Paul, strong sense critical thinkers have critical and reflective attitude towards ideas and are motivated towards seeking clarity and accuracy. Weak sense thinkers, on the other hand, refer to individuals who have learned the thinking skills and can demonstrate it when instructed but the skills are not incorporated into their way of living as it has not been cultivated into a habit.

Ennis (1987, p.10) conceives critical thinking as 'reasonable reflective thinking that is focused on deciding what to believe and do'. According to Lipman (1998), the definition proposed by Ennis stresses on the outcomes of critical thinking but do not take note of its essential characteristics. Lipman (1988) argues that critical thinking is more than merely making a decision. He states that if deciding what to do was critical thinking, then trivial matters like making a decision on going to see a doctor also involves critical thinking. Lipman (1988) defines critical thinking as a skillful and responsible thinking

that facilitates good judgment because it is depended upon specific kinds of criteria, it is self-correcting, and it is sensitive to the context. To Lipman (1988), critical thinking occurs from within and through interactions with peers and he rejects the notion of it being taught in a 'technical' manner. He favours the development of critical thinking through verbal exchanges among peers (Daniel and Auriac, 2011).

## 2.2    Thinking in relation to Education

Many researchers and educationists have long debated on when to introduce critical thinking into classrooms Some have argued that critical thinking skills should be introduced earlier to learners. However, most educational researchers have agreed that critical thinking should be implemented at a later stage when learners are about 10 to 11 years of age. It is claimed that at this stage the brain is more developed and mature to acquire complex cognitive abilities (Piaget, 1952; Vygotsky, 1986; Healey, 1990; Lipman, 2004; Wadsworth, 1971).

Lipman (2004) believes that learners are capable of employing logical operations, justifying their views, and monitoring their own thoughts by the ages of 5 to 7. He blamed Piaget for promoting the widespread belief that critical thinking should not be introduced at an early age as young children are not ready and incapable of performing difficult mental operations. Through Lipman's (1988) designed classroom activities, it was found that children who are in their preschool years can be trained to think logically and make good judgment.

Developing critical thinking is a complicated process as humans are not naturally critical (van Gelder, 1991). Vygotsky (1986) argued strongly that it is through social interaction with others that children learn to think. Critical thinking is refined and sharpened through the role of private speech and zone of proximal development. Private speech is also known as self-talk where speech is internalized to guide one's thoughts and actions. For a young child, private speech is usually spoken aloud. Vygotsky (1986) states that 'zone of proximal development' is the distance between the level an individual can achieved alone and the level he or she can achieve with the help of another person who is of higher capability or authority. This highlights the potential for cognitive improvement when social interaction with others is involved.

Kohlberg (1968) claims that as teenagers interact with each other, their mental processes are stimulated. They learn to appreciate different perspectives and are more open to argument when their opinions are challenged. This proves that teenagers have the capability in employing critical thinking skills into activities which are challenging and requires higher order thinking such as giving opinions and accepting different perspectives.

Mastering critical thinking takes practice. Learners need to be engaging in numerous practices in critical thinking skills in order to show improvement in their ability to think (Ericsson and Charness, 1994). Critical thinking is more of a lifelong journey than something an individual learns in a short course (Ruggiero, 2012). Therefore, learners need more exposure to activities and practice which allows them to employ and sharpen their critical thinking skills. Over a course of time these skills will be ingrained in them and

grow into a habit in which learners are able to employ critical thinking effectively in every area of their lives without being prompted to do so.

## 2.3    Influence of Chinese society in the development of critical thinking

In the last decade, many Chinese communities have shown significant interest into critical thinking. Some researchers (Tiwari, Avery and Lai, 2003 Ku & Ho, 2010; Ip, Lee, Lee, Chau, Wootton, and Chang, 2000; and Hau, Halpern, Marin-Burkhard, Ho, Ku, Chan, & Lun, 2006) have proven that on most disposition scales, Chinese students scored lower than Western students. This indicates that critical thinking skills are not actively practiced and integrated into their everyday life or in schools (Tiwari, Avery and Lai, 2003).

Atkinson (1997) claims that dispositional factors or good thinking habits exert a significant amount of influence on the critical thinking performances of an individual. In other words, cognitive competency and ability does not sufficiently show a correlation to individual differences in critical thinking performance. He found that in the Western context, students are individualistically orientated and are more open to accepting their viewpoints being challenged. Western students are found to put in more cognitive effort to seek the truth through open discussions and debates.

However, in many Chinese societies, traditional Confucian's values still influence the communities and schools (Hau, Halpern, Marin-Burkhard, Ho, Ku, Chan, and Lun, 2006). Respect for the authority, cultural and traditional practices and social harmony are highly valued and respected.

Therefore, diversity in opinions may be seen to be disrespectful, rude and a disruptions to the social harmony.

According to Yahaya, et. al. (2011), even though Malaysian Chinese consider themselves to be fully Malaysian, they still hold on steadfast to their Chinese culture and traditions. As can be seen in recent years, large segments of Malaysian Chinese are "Chinese educated" as ninety percent of Chinese parents today send their children to Chinese primary schools (Vernacular Schools in Malaysia Report, 2012). Similar to other Chinese societies such as China and Taiwan, traditional Confucian collectivistic culture also exerts potent influence in Malaysian Chinese schools (Lau, 201; Tiwari, Avery and Lai, 2003; and Ku and Ho, 2010).

In the Chinese community in China, Hong Kong, Taiwan, Singapore and including Malaysia (Ku and Ho, 2010), academic success is attained from hard-work effort than by cognitive ability. Careful reasoning and evaluative thinking are not considered to be the most important skills to be acquired in schools. There is more emphasis on rote learning where quantitative assessment methods encourage memorization of facts and figures. Traditional teaching processes in Malaysian Chinese schools urge students to receive ready-made information without having to go in-depth into the subject through classroom discussions (Thang, 2004). This phenomenon is also happening in other developing countries in Asia (Kember, 2000; Wong 2004).

Nisbett (2003) describes a Chinese student who has changed his view of Chinese students' ability to think critically. It has also spurred him to research deeper into the influence of Asian culture in critical thinking skills.

Nisbett (2003) found that Chinese students are able to listen and pay careful attention to a wide range of events. They seek to understand not in parts but understanding the whole to resist jumping into conclusions. Davidson (1998), Littlewood (2000) and Stapleton (2002) agree and found these skills to be true and observable in their studies of Asian students' thinking abilities. Some studies (Littlewood, 2000; Stapleton 2002) indicate that even though Asian students have difficulties in expressing their opinion, it does not necessarily mean that they passively accept all that they hear. Nisbett (2003) and Long (2003) claim that there are differences in Asian and Western mentalities, but Asian students should not be evaluated through the lens of Western expectations to yield more accurate findings. This implies that Chinese students are able to think critically but does not necessarily express their opinions and thoughts openly as students from Western society.

## 2.4    Piaget's Stage Model of Cognitive Development

Piaget (1952) has made a comprehensive study on cognitive development and his theories have had a major impact upon educational practice. Piaget believes that thinking develops through a series of stages. There are four main stages a child needs to go through in sequence without missing any of the important stages. Each stage unfolds universal intellectual characteristic which can be observed although there may occur considerable individual differences.

According to Piaget (1952), during the 'sensorimotor stage' (which develops between infancy to two years-old) an infant passes through a stage of

egocentrism whereby the infant is unable to separate itself from its environment. The development of this period is exponentially rapid and by the end of this stage the child would have learned to explore and gain a wider understanding of its surroundings using their motor and sensory skills. Also, an infant would have acquired object permanence as he or she would have begun to search for objects outside their field of vision.

When children reach the pre-operational stage (2 to 7 years), they will begin to use language and symbols to communicate and express themselves with others. Piaget states that at this stage a child will be able to grasp logic and focus on one aspect of an object or situation at a time. However, children this age may have difficulty recognizing that their own thoughts and perceptions may differ from those of others.

As a child's thinking ability continues to develop, he or she is no longer deceived easily. They would have progressed through concrete operational stage (7 to 11 years). It is possible for children at this stage to examine more than one dimension of a problem, and understand the notion of reversibility and identity. However, Piaget noted that children still have difficulty applying such mental processes to hypothetical events and abstract ideas at this stage.

Finally, from about the age of 11 years, adolescents become increasingly capable of formal operational thought as they are able to handle more complex issues and situations, and this development continues on until adulthood. This stage is characterized by the ability to think logically about abstract, hypothetical or imaginary concepts and situations. Concrete aids are

no longer necessarily required as ideas and reasoning for internal representations. At this stage, the ability to solve problems, express their opinions and disagreements becomes increasingly more organised and systematic. According to Moseley, Baumfield, Elliot, Gregson, Higgins, Miller, and Newton (2005), not all adults are able to reach the formal operations stage and think in terms of abstract rules and system. This implies that learners after the age of 11 years should be able to reason critically, solve problem, make rational decision and disagree with others in an organised and systematic manner. However, not all teenagers' thinking capability or mental operation develop at the same rate as some may be more advanced or weaker in their ability to think critically or handle complex issues and situations.

## 2.5    Ennis' taxonomy of critical thinking abilities

According to Ennis (1985, p.45), critical thinking focusses on deciding what to believe or do through reflective thinking. Ennis has developed a comprehensive set of goals for critical thinking dispositions and abilities which are intended to provide schools or colleges a rational for teaching and assessing critical thinking.

Ennis'(1985) taxonomy of critical thinking disposition and abilities has been refined and sharpened over the span of 30 years. According to Moseley Baumfield, et. al (2005), the significant feature of his taxonomy is that it primarily focuses on attitudes that individuals should have in deciding what to belief or do. It is also organised in such a way that it can serve as an outline for the incorporation of critical thinking into schools' curriculum because of

the list criteria provided to evaluate the employment of critical thinking dispositions and abilities.

According to Ennis (1985), the basic areas of critical thinking encompass the ability to clarify, evaluate the basis of a decision, make inference, hypothesize, and employ appropriate rhetorical strategies in discussions. Ennis (1985) has divided critical thinking to 15 abilities in which an individual can acquire in order to be a critical thinker.

In Ennis' taxonomy of critical thinking (1985), one of the areas on critical thinking is to be able to identify the underlying issue of a subject. Next is to analyze whether the arguments are valid and rationale to the discussion. In producing valid arguments, one needs to substantiate an argument with relevant reasons and evidences. The third area is to be able to ask and answer questions that may be challenging in order to obtain consistency. The fourth ability is to provide accurate meanings of terms and to deal with ambiguity which may be used to conceal the truth. Basically, the first four abilities describe the importance of clarification while presenting arguments.

The fifth area is to judge whether reasons provided are trustworthy without hidden conflict of interest.   The next area is to judge whether observation reports are reliable as it helps to ascertain the accuracy of a conclusion. This provides a justification for this type of conclusion.

For reasonable inferences to be drawn a good critical thinker should have the ability to identify unstated assumptions and it is also considered as an important area an individual should look into in order to be an effective critical thinker. The eighth area is to be able to deduce consequences, and

determine whether the deductions are accurate. The ninth area is to judge whether during inductive reasoning, premises stated give strong conclusive evidence for the truth of its conclusion. Inductive arguments stated can be evaluated as strong or weak according to the degree of probability which their premises confer upon their conclusion.

The next area is known as making value judgment and it is a necessary aspect to acquire in decision making. Before deciding upon an action of belief, every possible consequences or alternatives should be considered. The reasons and evidences used to substantiate a claim should be ensured that they are warranted. The twelfth area is to be able to defend a decision through integrating disposition such as simplicity, comprehensibility, or conformity of its language to everyday meaning with other critical thinking abilities.

The last three areas of Ennis'(1985) taxonomy focus on the need to provide supplementary help and support when employing critical thinking skills. The thirteenth area discusses the need to employ a reasonable critical thinking checklist and follow up with problem-solving steps in order to deal with a situation in an appropriate manner. The next area discusses the importance to be sensitive to the feelings, opinions, thoughts and degree of sophistication of others. Blatz (1992) states that Ennis'(1985) taxonomy is suitable to assess context-based assessments, however, the results of the assessment will be more effective if information is gathered over a period of time and across a range of situations. The taxonomy provides a wide range of critical thinking abilities that an effective critical thinker possess and therefore, it is suitable to assess students' verbal arguments, discussion or presentation.

## 2.6    Argument

The word "argument" is often used in everyday language to refer to a heated conversation or discussion between two or more people disagreeing with each other furiously. Generally, the everyday conception of an argument can be perceived as a quarrel, dispute or a shouting match that may have been transpired from an unfair or wrong situation (Cambridge Dictionary, 2003).

In the study of critical thinking, the term 'argument' is a fundamental concept. An argument can be defined as a rationale for conclusion, or an activity in which individuals employ critical thinking skills to reason, express their opinions and defend their positions through the means of speaking or writing (Kirby and Goodpaster, 1995).

According to Epstein (2002); and Moore and Parker (1995), an argument is a collection of statements where one is called the conclusion and the other statements are called premises. The conclusion is the truth in which the argument attempts to establish; and the premises are claims or proposition put forward to lead, support, or convince that the conclusion is true

According to Sinnott-Armstrong (2009) and Fogelin (2009), arguments are explicit ways to formulate reasons. An argument is a series of sentences, statements or propositions where some are the premises and one is the conclusion (Sinnott-Armstrong, 2009). The premises are intended to give a reason for the conclusion. They further state that the main purpose people engage in argument is to persuade, justify and explain their point of view. Persuading is the process of making people believe or do something that they would not otherwise believe or do. On the other hand, justifying is to provide

someone with reasons to believe the conclusion. Giving explanation is to support why an event happened or why a phenomenon is true. However, an explanation is not a prediction, generalization, or justification of a phenomenon. As what is explained in an argument, the goal of explanation is to fit a particular phenomenon into a general pattern in order to increase understanding and remove any bewilderment or surprises (Sinnott-Armstrong, 2009; and Fogelin, 2009).

In examining argument as critical thinking, there are two kinds of arguments that can be distinguished. The first one is called 'rhetorical' argument which is to demonstrate the truth or falsehood of an issue, and these arguments comprising a course of reasoning are used (Kuhn, 1992). The other is known as 'dialogic' argument which occurs more commonly than the former (Kuhn, 1989; and Kuhn 1992). In this case, each person makes a claim and offers justification for his or her own viewpoints, and attempts to rebut the other viewpoints through the means of counterargument.

Freeley and Steinberg (2009) states that in a dialogic argument, the speaker recognizes an opposition between two assertions encountered and he or she considers both incorrect on surface appearance. Then, by supporting views which are emphasized and evidence to each of the assertions, arguments are refuted. Ideally the argument should move towards a resolution where evidence provided are weighed and analysed in an integrative evaluation. In a rhetorical argument, the same skills are entailed but in a more implicit form and less complex. Arguments supporting an assertion are often empty as opposing assertion rarely takes place (Kuhn, 1992). Therefore, an argument in the present study is referred to as a dialogic argument in this sense.

According to Kirby and Goodpaster (1995), there are two forms in which arguments can be reasoned or organised logically. One is known as deductive argument and the other is inductive argument. A deductive argument begins with two or more universal premises which guarantee that its conclusion is true (Kirby and Goodpaster, 1995). It goes as follows, for example:

Premise 1      : All cats are mammals.

Premise 2      : Tim is a cat.

Conclusion    : Therefore, Tim is a mammal.

An inductive argument involves the premises to provide some grounds to make a conclusion more probable (Kirby and Goodpaster, 1995; and Freeley and Steinberg, 2009). The premises are not to proof that the conclusion is absolutely true or valid. The premises in an inductive argument consist of observations or a set of evidence.

## 2.7     Fallacies in Informal Reasoning

Fallacies are commonly used in everyday dialogues as a means to persuade or deceive people into believing their reasons or rational. Hence, the widespread of fallacies are high as they are psychologically persuasive but logically flawed and unreliable (Paul, 2006; Ramasamy, 2011; Rudinow and Barry, 2008; and Walton, 2010). Fallacies can be detected easily in isolation. However, when they are woven into the context of an argument many may not be apparent unless one is alert (Freeley and Steinberg, 2009). Whately (1975)

defines fallacy as any argument which is unsound or unsubstantiated that appeals to one's conviction and to be assured of the questionable claims made, when in fairness it is not.

Manktelow (2012) states that fallacies may be used intentionally or accidentally. According to Walton (2010), fallacies that are employed deliberately in discussions or debates are used to sway their listeners and secure an unfair decision. The arguments are fallacious as it contains pattern of illusions and deceptions to give the appearance of truth and reasonableness.

Fallacies can be classified into various groups and subgrouping. In an actual argument, be it orally or written, fallacies are often interwoven. An invalid or fallacious argument may be a complex of several fallacies (Freeley and Steinberg, 2009; Paul, 2006).

## 2.7.1   Ad Hominem Argument

According to Freeley and Steinberg (2009), when someone uses an argument to have the opponent's argument rejected by attacking the character of the opponent who is advancing their argument, then this is an invalid argument. It is a fallacy because the argument is not made against any merit or defect intrinsic to the opponent's argument but made against the character or personal attributes of the person advancing the argument (Freeley and Steinberg, 2009).

Brink-Budgen, (2007) claims that the term ad hominem is originated from Latin which literally means 'to or at the man'. This form of argument

was first introduced through the works of Aristotle on dialectical refutations. It is fallacious because the rather than arguing against or refuting the argument presented, the personal attributes of the opponent who proposed the argument is attacked instead.

According to Duplass and Zeidler (2000), ad hominem arguments are irrelevant as it does not address the worth of the premises presented neither does it seek to prove that the opponent's argument is false, but instead it is used to discredit a person's character or credibility.

However, some theoreticians (Tindale, 2007; Walton, 1998; Johnson, 2009) believe that ad hominem arguments are relevant and appropriate, and it should not be considered as fallacious. Walton (1998) and Tindale (2007) claims that it is reasonable to attack the position of the arguer, if the arguer's action is inconsistent with the arguer's position or statements. In other words, if the arguer does not do what he or she preaches, then the arguer should be opened to questioning on their character or credibility as it can be disputed.

Brink-Budgen (2007); and Freeley and Steinberg (2009) asserts that this form of argument diverts people's attention from the argument to the person. So, this type of fallacy can also be used as a strategy to silence the opponent and gain the support of the listener or audience.

### 2.7.2 Slippery Slope Argument

Slippery slope argument is a form of fallacious reasoning that uses a chain of conditionals some or many which are dubious (Epstein, 2002). Slippery slope argument arises from an unwarranted assumption, and if one accepts or rejects the initial assumption, then it will lead to a series of negative consequences from one to another until an extreme disaster occurs (Rudinow & Barry, 2008; Brink-Budgen, 2010).

Brink-Budgen (2010) outlines it in an argument structure:

- If A, then B; if B then C; if C then D… if P, then Q.

- If A then Q

The above argument structure occurs due to inadequate evidence as they rely on speculative or insufficiently empirical premises (Brink-Budgen, 2010; Douglas, 2010). The initial starting point for the argument is not enough to justify where it ends up. There is also no obvious connecting points between A and Q in an argument, but if A is accepted, then one is committed to Q. The 'slope' is said to 'slippery' because there are no plausible halting points between the initial assumption to a premise, or action and thus 'sliding' all the way to the conclusion which bears a negative consequence or outcome (Epstein 2002; Wright 2000).

### 2.7.3   Hasty Generalization

A generalization is a spoken or written statement made about a class of objects or situations which are based upon an observation of some member of that class (Kirby and Goodpaster; 1995). All inductive thinking uses generalization as it moves from the particular or specific to the general. A reasonable generalization is one that has a large enough sample to warrant an inference (Kirby and Goodpaster; 1995).

According to Paul and Elder (2006), when a conclusion is drawn from premises or evidences that occur in either too few instances or atypical, then this form of generalization is referred to as hasty generalization. Kirby and Goodpaster (1995) and Hurley (2003) expressed that hasty generalization as a kind of inductive fallacy. When a conclusion is drawn from a sample that is too small or in some way unrepresentative, then hasty generalization fallacy is committed when the statistical significance of evidence taken from the sample is exaggerated (Rudinow & Barry, 2008). This form of fallacy violates the requirements of good reasoning in sampling theory.

Hasty generalizations often occur in verbal arguments between two people or more. For instance, in the heat of anger, one might accuse the other party of being unhelpful because during the past year he or she may have not helped a few times. Or a wife might accuse her husband, who occasionally forgets to do the laundry and mop the floor, of never helping in household chores.  The accuser can easily remember the number of times in which the chores were not done but fails to notice the numerous times that they were done. The accuser is selective in placing their attention to notice only the bad

and not the good. Such arguments are often based on hasty generalizations that are stereotypes and the number of evidences on which the accusation is based on is too small to warrant the conclusion (Walton & Gordon, 2009; Johnson & Blair, 1977 and Kirby and Goodpaster, 1995).

Walton and Gordon (2009) allege that hasty generalization occurs when there are (1) inadequate premises as evidence to draw a conclusion, (2) fallacious argument stemmed from ignorance, (3) unrelated premises or evidence linked to wrong conclusions, (4) suppressed or overlooked evidence.

Duplass and Zeidler (2000) also state that individuals commit hasty generalizations in their arguments by overemphasizing on rare events to generate a greater impact on their readers or listeners and to garner support, or by underestimating the occurrences of common events in order to undermine the importance of the occurrences.

According to Kirby and Goodpaster (1995), there is no fix set of rules that one can use to determine whether the generalization is reasonable or not; each requires a different set of facts. Therefore, any claim that is being established and intends to be held true, adequate reasons and evidence which are linked to the claim need to be provided to support and strengthen the claim. Without related reasons and evidence, the claim would be a hasty generalisation and the result of poor reasoning.

### 2.7.4   Tu Quoque Argument

In Latin, tu quoque means 'you too' (Brink-Budgen, 2007). Tu quoque argument is made by discrediting the argument of the opponent who has failed to act consistently with the claims they made (Brink-Budgen, 2007). Eemeren and Peter Houtlosser (2001) explain that it is a strategic maneuvering from the topic by attempting to dismiss the opponent's argument based on criticism of the opponent's inconsistency and not on the position presented. They state that by pointing out any inconsistency in an argument is perfectly sound, but if it becomes a 'derailment of pointing out inconsistencies' then it will result in tu quoque fallacy.

According to Brink-Budgen (2007), there is another version of tu quoque fallacy which is also concerned with the problem of consistency. Epstein (2002, p.209) terms this version of tu quoque as 'appeal to spite'. Brink-Budgen (2007) state that the second type of argument is based on the point that if an issue which is apparently unacceptable but has been done or defended previously, then the current issue which is about the same subject becomes acceptable even though it is defended by others. Epstein (2002) states this fallacy follows the principle that 'two wrongs make a right'. In other words, it is said to be a weak argument as the premises and evidence presented are irrelevant to the conclusion, and therefore the conclusion is left unsupported and the conclusion that is intended to be established fails to take place (Eemeren and Peter Houtlosser, 2001).

### 2.7.5   Straw Man Argument

The fallacy of the 'straw man' argument occurs when an issue is set up merely to knock it down (Freeley and Steinberg, 2009; Walton, 1996). This fallacy occurs in the counter-position where an argument is being opposed or defended.

According Brink-Budgen (2007), the arguments presented in the counter-position are ludicrous and distorted. It would seem meaningless to refute a pointless argument where evidence provided in the premises are irrelevant. The term 'straw man' itself is used to illustrate a weak version of a man that can be easily knocked down and be blown away. Straw man fallacy is also term as 'reduction to absurdity' or in Latin is known as *reductio ad absurdum* because it employs the strategy of showing a position that is being defended as an absurd one (Brink-Budgen, 2007; Walton 1996).

Freeley and Steinberg (2009) state that a straw man argument is also committed when the arguer refutes a minor argument of their opponents and claim they have defended and opposed the whole case, or the arguer refutes that their opponents did not make any progress in their case and claim that they have refuted their opponent's position.

### 2.7.6   Circular reasoning

In an argument, a set of premises or reasons are presented to support a conclusion. However, if an argument is circulating around identical premises as the conclusion then it is known as circular reasoning (Kirby and

Goodpaster; 1995; Freeley and Steingberg, 2009). Circular reasoning is also known as 'begging the question'.

When the statements in the arguments are short, circular reasoning can be identified easily. However, when the argument is lengthy and the premises are numerous, the listener or reader becomes more vulnerable to accepting it (Kirby and Goodpaster; 1995).

Sinnott-Armstrong (1999) states that the clearest case of a circular reasoning displayed is when the conclusion is taken word for word from one of the premises. If a conclusion is presented similar in meaning as one of the premises, it can also be considered as circular reasoning. Brink-Budgen (2007) stated that this form of fallacy occurs under the most extreme case of inadequate evidence presented. Sinnott-Armstrong (1999) states that circular reasoning is subtle and complex, and therefore this form of argument needs to be analysed in its context for its purpose, reason and justification stated or assumed to be in the premises in order to prevent over-looking circular reasoning which are not obvious or direct.

## 2.8    Other Related Research Findings

This section intends to discuss some other research findings on critical thinking in relation to education and gender. There are many quantitative studies conducted in this area but not many studies used qualitative methods. Nevertheless, both methods yield findings that can be useful and linked to this current study.

Rosyati and Rosna (2008) conducted a study on 261 students of undergraduate students in Malaysia. It was found that 63.6% of the students belonged to the 'low' critical thinking skills category and only 8.8% were of 'high' critical thinking skills category. This may imply that students thinking skills were not fostered in secondary schools and hence resulting in students' poor performance when their thinking skills are assessed. Their previous education would have direct influence in the way their thinking was shaped and along with other personal and social factor. Therefore, critical thinking skills need to be instilled in students from a young age.

Ramasamy (2011) who conducted a study on 189 Malaysian undergraduates concluded that good critical thinking disposition or habits are stemmed from a wide exposure to a variety of activities such as reading, arguing, and role-playing. These activities provide students the opportunity to employ critical thinking skills and promote a habit to think critically. Ramasamy (2011) also found that rote memorization is still being practiced in universities and this implies that students are still depended on their teachers to hand down information.

In investigating gender differences on critical thinking measures have found conflicting results. There has been a wide range of studies that suggest men and women think differently and employ different critical thinking skills. Most studies reported gender differences favoring either men (Walsh and Hardy, 1999; Miles and August, 1990; Aliakbari and Sadeghdaghighi, 2011; and Leach, 2011) or women (Ricket and Rudd, 2004; Aybek and Aldag, 2009) and some reporting no differences (Kuhn, 1992; Kawashima and Shiomi, 2007; and Azar, 2010).

Some researchers have argued that women as less capable of making rational decisions than men (Miles and August, 1990; Aliakbari & Sadeghdaghighi, 2011; and Leach, 2011). Ricket and Rudd (2004) found that male students are more inquisitive and truth seeking in looking for answers through social dialogues or written materials than their female counterparts. Another research conducted in Turkish universities showed that female students' scored higher in performing critical thinking abilities than male students, and it was also found that female students were also more open minded to accepting different perspectives and giving opinions (Aybek and Aldag, 2009). However, Husain, et. al 2012 who conducted a quantitative study on 951 Malaysian students, argue that there were no significant differences between male and female in their critical thinking skills ability. They low marks in their critical thinking skills ability when tested.

With the inconsistent findings on gender differences in relation to critical thinking has suggested the need to take this variable into account in research.

## 2.9   Summary

Chapter Two has given an overview on critical thinking. It has focused on critical thinking in relation to education and the development of critical thinking in Chinese Society. Next, it has explained on Piaget's Cognitive theory focusing in the formal operational stage, and followed by a detailed discussion of Ennis' taxonomies of dispositional criteria which are appropriate to assess individual's verbal arguments. In the next section, valid arguments and invalid arguments were expounded and different categories of fallacies were also highlighted in the following section.  Lastly, other related researches done on critical thinking have also been discussed in that section. In the next chapter, an overview of the research methodology and analytical framework of this study are discussed.

**CHAPTER THREE**

**METHODOLOGY**

**3.0    Introduction**

This chapter discusses the methodology employed in the research. It will discuss the research design employed, background of participants, the data instruments used, the data collection procedures and the data analyses procedures.

**3.1    Research design**

This research is qualitative in nature. It aims to examine and analyse the data extracted from verbal arguments that were conducted in groups of four within an ESL classroom of an urban Chinese secondary school. As the focus of this study is on a group of Chinese students over a period of two weeks to obtain data, a grounded theory method would be appropriate. In other words, this study will provide the data and attempt to analyse the data before presenting the possible theories that could support the findings.

The study aims to examine and investigate the elements of critical thinking used by the teenage participants in a discussion. It is believed that through a qualitative research, the researcher will be able to do an in-depth study into looking at the elements of critical thinking used by Malaysian ESL

students and to compare the differences between male and female verbal arguments.


**3.2    Research Samples**

In this study, students from a secondary school in the Klang valley were selected through convenient sampling methods because they match the aim of this study. The participants consist of 16 Malaysian Chinese students; nine male students and seven female students. The particulars of the students for each group are illustrated below in Table 3.1:

Table 3.1: Background of the participants

| Group | Participants | Gender | Age | First Language |
|-------|-------------|--------|-----|----------------|
| 1 | B1 | Male | 17 | Hokkien |
|  | B2 | Male | 17 | Mandarin |
|  | G1 | Female | 17 | Mandarin |
|  | G2 | Female | 17 | English |
| 2 | B3 | Male | 17 | Hokkien |
|  | B4 | Male | 17 | Hokkien |
|  | G3 | Female | 17 | Mandarin |
|  | G4 | Female | 17 | Mandarin |
| 3 | B5 | Male | 17 | Mandarin |
|  | B6 | Male | 17 | Cantonese |
|  | B7 | Male | 17 | English |
|  | G5 | Female | 17 | English |
| 4 | B8 | Male | 17 | Mandarin |
|  | B9 | Male | 18 | Mandarin |
|  | G6 | Female | 17 | English |
|  | G7 | Female | 17 | Mandarin |

Based on Table 3.1, all the participants were Chinese and the ages of this group of participants are between 17 to 18 years-old. The participants were placed in dyadic mixed-gender group for the verbal arguments, whereby

each dyad consists of either two female students or two male students and together a group of four is formed.

English is a Second Language for some of these teenagers, as six out of the sixteen participants speak Mandarin, three participants speak Hokkien, one participant speaks Cantonese and four participants speak English. From Table 3.1, we can deduce that most of these teenagers' first language is Mandarin, or one of the Chinese dialects. Besides that, most of their school subjects are taught in Mandarin as the school they come from is a Chinese vernacular school. Hence, their strong language would be Mandarin as opposed to English.

In the beginning of the semester, the participants enrolled in a Listening and Speaking Course (refer to Appendix A). The objectives of this course include the mastery of listening and speaking skills. The class was content-based in nature, and explored several themes (such as teenage angst, relationships, suicide) through a variety of listening activities (using videos and radio interviews) and speaking activities, which included group discussions, debates and other forms of oral presentations.

The participants were selected based on two main criterias: 1) their willingness to participate in this research, and 2) according to their *Penilaian Menengah Rendah* (National Lower Secondary Examination) English grade (refer to Appendix B). Based on their PMR English Result, 13 of them had obtained an 'A' and another three participants obtained a 'B'. A minimum 'B' is requisite in order to take part in this research. This is because the minimum proficiency level is used to set a baseline among the participants and this helps

to prevent their L2 limitations from hindering their ability to express their arguments well. This suggests that all the participants have the competency to speak and argue in English.

## 3.3 Research Instruments

### 3.3.1 Video Recording

The instrument used to capture the discussion among the students is a video camera installed in a Dell Inspiron Laptop. This allows the researcher to playback the video recordings repeatedly when transcribing the data. In addition, it allows the researcher to observe any paralinguistic cues which occurs during the discussion. Real time observations may miss out on observing many of these cues.

### 3.3.2 Demographic survey

The second instrument used was a demographic survey (refer to Appendix C) which was given to all 16 students who participated in this research after the oral assessment was completed. The main intention of this was to obtain students' background information, languages that they are able to converse in fluently, and the used of the English language with their surroundings.

## 3.4    Data Collection Procedure

This research followed the following sequences. Firstly, the researcher enlisted the participation and cooperation of the students. Students were informed of the need to conduct this research. Then, permission was obtained from the participants in the study. They were given a consent form (Appendix D) to sign and which would permit the researcher to record their classroom discussion. Majority of the students from the class responded positively, however, only four groups were selected for the purpose of this study because the number of male students was larger than the number of female students in this classroom. Therefore, this poses a hindrance in forming a dyadic mixed-gender group.

For the classroom discussion, the participants were given a list of 4 topics to choose 1 from it. The topics are based on the theme of the school syllabus. Participants were given two weeks to prepare their arguments before the class discussion (verbal arguments) was conducted. All four discussions took place over an interval of two weeks, with an average of two discussions per week. Participants were given instructions on the rules and regulations of the discussion, and also guidelines to prepare for the discussion. Each group consists of two dyads, and each dyad is made up of either two female participants or two male participants. In each group two participants (or one dyad) are placed in the position to support the topic and two participants (or the other sets of dyad) were placed in the position to oppose the topic or support a different perspective of the topic. The two sets of dyads in each group have to reason, argue, defend and oppose the opponents' claims. The reasons provided by the participants have to be logical and relevant to the

topic, and the evidence brought forth during the discussion may be based on personal experiences, facts, comparisons and analogies, logical explanations, statistics and pointing out consequences (Ramage and Bean, 1999). They were also informed when their arguments are refuted or challenged by their opponents, then they have to justify and defend the claims that they have made in their arguments.

After all the recordings were done, a demographic survey form was given in order to obtain background information of the participants. At the end of each discussion, the audience would vote for the dyad in the group who brought forth the best arguments. The researcher selected students from the audience to explain the reason of why they voted for the dyad of their choice. The purpose of getting feedbacks and comments were not used for the purpose of data analysis but it was done for the benefit of the participants as it is to help them recognize their strengths and weaknesses in presenting arguments in a classroom discussion. With the feedback received after each discussion the participants could be encouraged to make improvements in their presentation skills.

### 3.4.1   Pilot Study

A pilot study was conducted on 5 groups of students from a different class. The purpose of carrying out a pilot study was to investigate whether the topics selected were able to generate a discussion within the allocated time. It was also to check whether the instructions given for the task were sufficient and effective. From the pilot study, it was found that the allocated time for each group was

sufficient; however, some topics were removed as not many arguments were able to be generated.

Table 3.2: Topics Selected for Discussion

| Group | Topic |
|-------|-------|
| 1 | It is okay for boys and girls to enter a relationship during school days. |
| 2 | Girls are better at managing money even though they shop more. |
| 3 | Who Makes A Better Boss? Ladies or Men. |
| 4 | Girls can play sports such as basketball and football well too. This shows that both girls and boys are equal. |

The topics selected by the groups of participants are as indicated in Table 3.2. The topics that were given for them to choose themes selected from the school syllabus. The topics provided them a good opportunity to argue and refute using arguments that were supported by facts, opinions, evidences and personal experiences. It was found that when the content of the topics were related to personal matters such as past and present relationships, or school-related matters such as teachers, peers and school activities could generate openness and encourage desired responses (Freed, A. F., & Greenwood, A., 1996). Therefore, the topics that were selected by the participants were to generate such a discussion within the stipulated time.

All the spoken discourse of the discussions were recorded was then transcribed orthographically as verbatim for the purpose of examination and analysis. The data were transcribed using Jefferson's (1979) transcription conventions (Appendix F). The recordings had to be listened repeatedly and watched carefully in order to transcribe the data as accurately as possible. This covered nearly 200 hours and parts displaying arguments were selected for analysis.

**3.5     Details of the discussions**

Table 3.3: Details of discussion

| Group | Place | Time | Duration |
|---|---|---|---|
| 1 | Classroom | Morning | 10 minutes 27 seconds |
| 2 | Classroom | Morning | 10 minutes 48 seconds |
| 3 | Classroom | Morning | 17 minutes 9 seconds |
| 4 | Classroom | Morning | 12 minutes 24 seconds |

Based on Table 3.3, all four discussions seen share several similar aspects, which are: the duration or length of time allotted, and the setting or place of the recording. All the discussions were recorded in the morning and the discussion took place in an ESL classroom. The video recordings of each discussion were between ten to seventeen minutes.

The length of the discussion was intended to be ten minutes long, but the duration of the discussion sometimes depended on the dynamism of the speakers. Certain conversations took more than ten minutes and additional time allowances were given as there were variations in longer turn-takings, speech rate, and the verbosity in the individuals.

**3.6     Analytical Framework**

In order to gauge the level of critical thinking skills employed by these teenagers in a spoken discourse, Sinnott-Armstrong and Fogelin's Reconstruction of Argument Model (2009) and Stapleton's Element of Critical Thinking Structure (2001) were adapted and combined to form the framework

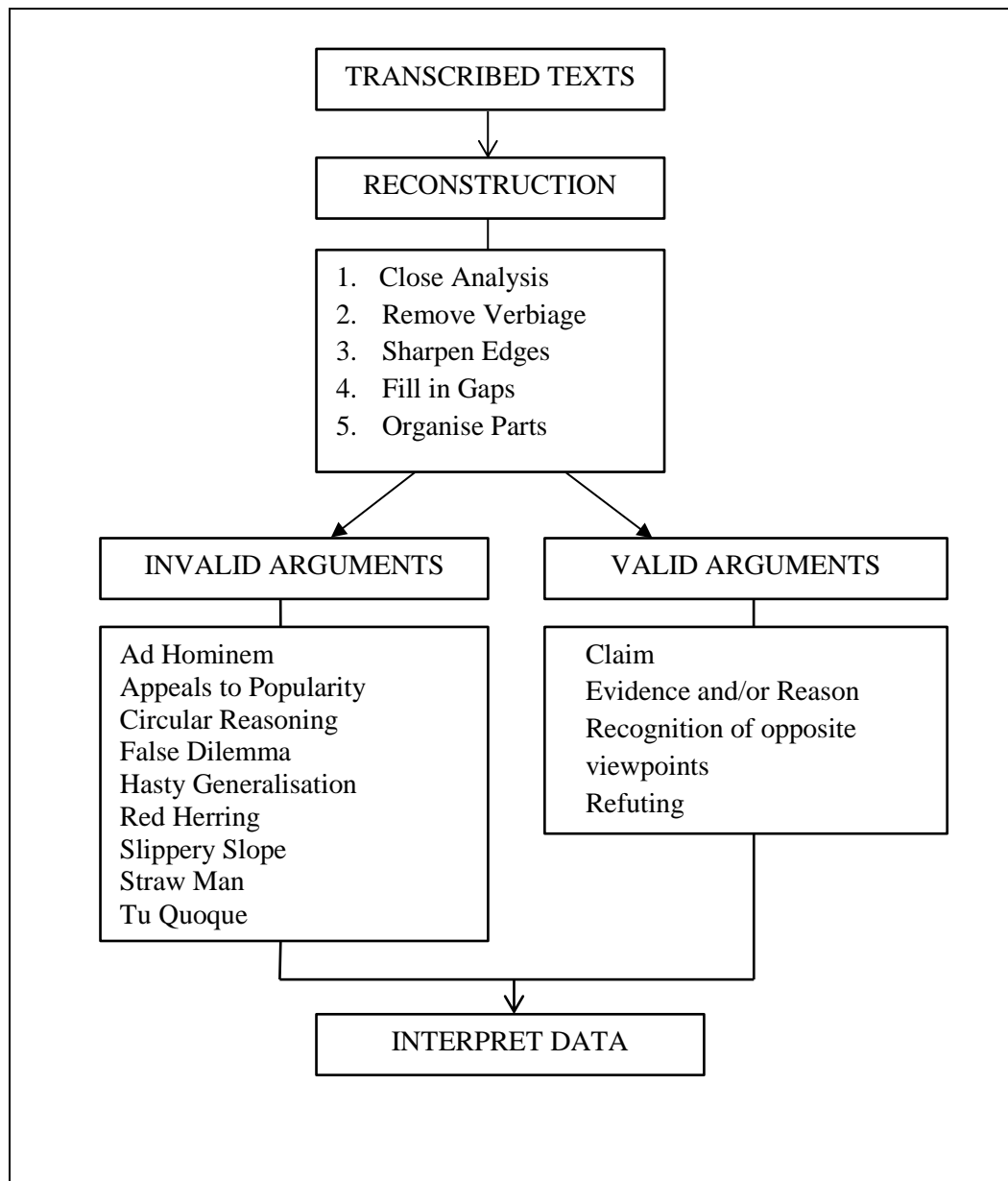of this study.  The analytical framework employed for this study is illustrated in Figure 3.1:



Figure 3.1 Framework adapted Sinnott-Armstrong & Fogelin (2009) and Stapleton (2001)

In Sinnott-Armstrong and Fogelin's Reconstruction of Argument Model (2009), arguments are reconstructed and organised in a form that the elements of critical thinking can be assessed accurately and fair.

On the other hand, Stapleton (2001) used six main elements of critical thinking to analyse the data of his study. He identified the premises and categorized them according to the roles it plays as some premises are intended to give reason or evidence for the conclusion. The main elements of critical thinking are: conclusions, arguments, reasons, evidence, recognition of opposition and refutations, and fallacies. However, for this study counter-argument is used in place of recognition of opposition and refutations, as the term 'counter-argument' in general comprised of both 'recognition of opposition' and 'refutations'.
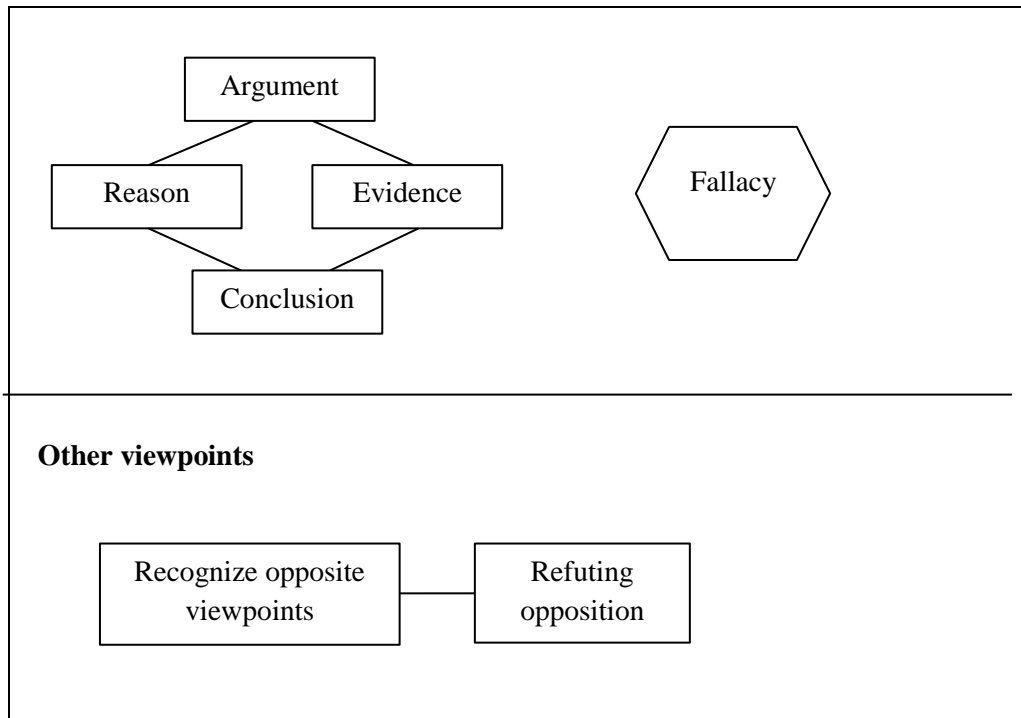


Figure 3.2 Stapleton's Elements of Critical Thinking Structure

There are many thinking frameworks for measuring critical thinking skills. However, Sinnott-Armstrong and Fogelin (2009) and Stapleton (2001) frameworks were selected because they were more suitable to assess the

elements of critical thinking skills found in the verbal argument as compared to other frameworks which mainly analysed written arguments.

## 3.7      Data Analyses Procedure

This study used the analytical framework proposed to assess the elements of critical thinking displayed in the discussion and will be presented in the forms of tables and graphs. The proposed framework will be used to identify and evaluate (a) the number of valid arguments, (b) types of evidence, (c) counter-arguments and (d) number of fallacies. The elements identified will be able to ascertain the ability level of the participants to employ critical thinking in a discussion. Then the results from the data will also be used to assess whether there are any differences in the way female and male students think critically.

Firstly, in order to understand arguments better and categorize them accurately according to the elements of critical thinking, Sinnott-Armstrong & Fogelin's Reconstruction of Argument Model (2009), was used to analyse the spoken discourse data. The goal of reconstruction is to put an argument in a form in which we can easily and accurately assess critical thinking in a manner as fair as possible.

**Reconstruction**

```
┌──────────────────┐
│  Close Analysis  │
└──────────────────┘
          │
          ▼
┌──────────────────┐
│  Remove Verbiage │
└──────────────────┘
          │
          ▼
┌──────────────────┐
│  Sharpen Edges   │
└──────────────────┘
          │
          ▼
┌──────────────────┐
│  Organise Parts  │
└──────────────────┘
          │
          ▼
┌──────────────────┐
│   Fill in Gaps   │
└──────────────────┘
```
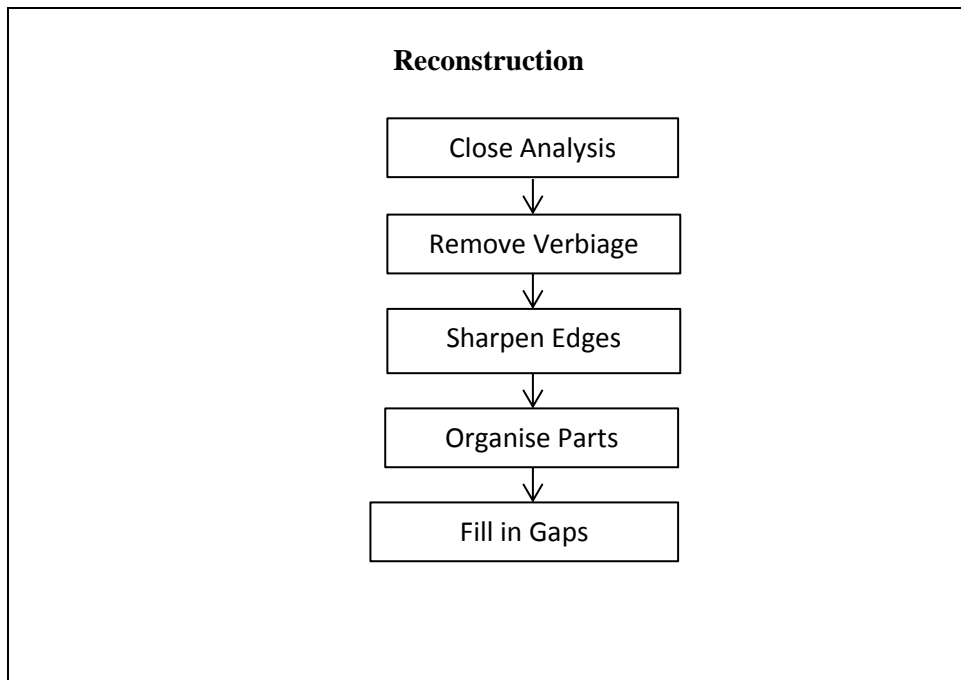
Figure 3.3 Sinnott-Armstrong & Fogelin's Reconstruction of
Argument Model (2009)

A close analysis was first carried out by marking the premises in the data according to the role it plays. So, if the premise is a conclusion, then it will be marked with a 'C'. A reason will be marked with a 'R', an evidence will be marked with an 'E', and a fallacy will be marked with a 'F'. It is easier to show the role that a premise plays by labelling the data as shown in the example below.

**Example 1**

(C) Firstly. ur. ur. parents need to control ah. how their children use their mobile phones and tablet-devices/ (E) This is because ah. evidence. evidence has shown a recent doubling in the texts sent and received by teenagers today. with an average of about 120 messages a day/

⬇

(C) Parents need to control how their children use their mobile phones and tablet-devices.
(E) Evidence has shown a recent doubling in the texts sent and received by teenagers today, with an average of about 120 messages a day.

In example 1, there are two premises. The second sentence provides an evidence for the first sentence. The speaker states the main point of the argument in the first sentence. Therefore, the first premise is identified as the conclusion, and the second premise in which the conclusion is drawn from is the evidence.

At the second stage, all the excess the verbiage which consists of repetitive words or sentences, fillers, and linking words are removed. When excess verbiage has been removed, the explicit premises and conclusions of the arguments can be listed out easily. In example 1, the linking word *'firstly'* and the fillers *'ur. ur' 'ah'* and the repeated word of 'evidence' is removed. In doing so, the conclusion and reason are able to be presented clearer as illustrated in the above.

According to Brown and Keeley (1994), critical thinking does not merely entail restating an argument repetitively with the same reasons. Therefore, removing all excess verbiage is important as it helps to identify the real point of an argument from the data noticeably.

Next, any parts of the arguments that are not clearly stated are sharpened and gaps are filled in order to provide adequate precision and clarity. As shown in the example below, the word 'unnecessarily' is added into the conclusion in order to provide a clearer precision and clarity. Without the added word, the conclusion is unclear as it may indicate that boys do spend money on facial cleanser and bags, but it does not stress on the point that the spending is unnecessary. However, this is done within the context of the argument and not based on any assumptions of the researcher.

**Example 2**

I think boys also spend money because they buy. ah. maybe now they also buy cleanser not like just girls. and then they buy bags.

↓

**(C)** Boys spend money [unnecessarily].

**(R)** They also buy cleanser and bags just like girls.

At the following stage, reasons, evidence and conclusions are organised and arranged systematically based on Stapleton's Elements of Critical Thinking Structure (Figure 3.3). Each piece of reason and evidence are evaluated and counted in order to establish the legitimacy of an argument. This is an important stage whereby the arguments are taken to be, when they are supported by reasons, however, an unsupported argument are merely opinions (Brown and Keeley, 1994).

An argument that is not supported by reasons and evidence is considered as an invalid argument or also known as a fallacy. Each fallacy is carefully analysed and categorized according to the types of fallacy that it occurs. The types of fallacy used to examine the data in this study are: ad hominem, circular reasoning, hasty generalisation, slippery slope, straw man and tu quoque.

During the mixed-dyad discussion, a definitive conclusion is not considered necessary even though most participants are expected to agree or disagree with the claims of their opponents (Brown and Keeley, 1994). According to Stapleton (2001), a participant is allowed to remain undecided and still be a good critical thinker, provided one offers balanced reasons and evidence for one's indecision.

When the valid arguments and invalid arguments have been distinctively determined, the researcher reexamined the arguments for participants' counter-arguments which are later evaluated and counted. Finally, the findings of the study are interpreted in the discussion.


## 3.8    Summary

This chapter discussed the methodology the research design in the first section, and this is followed by the research samples that participated in this study. Following that, an explanation on the instrumentations that were used for the study was also discussed. The analytical framework that was used in this study was also explained and discussed in detail. Next, the steps taken to collect the data and the methods used analyse the data were recorded and explained in an organised manner. It is hope that the research method taken by the researcher will be able to find answers to the research questions of this study.

# CHAPTER 4

# DATA ANALYSIS AND RESULTS

## 4.0    Introduction

This chapter discusses the distribution of critical thinking elements found in the speech of male and female students in a verbal argument (discussion) at a secondary school. This research was carried out on 16 Senior of a Chinese secondary school situated in in an urban district of Selangor. The school is situated in an urban area of Klang. Data were extracted from participants' arguments which were orthographically transcribed and then analysed.

The analyses of data and findings are presented in accordance to the research questions which this study sets out to address. Research question 1 is answered by analysing the transcribed data for elements of critical thinking. A frequency count in critical thinking elements that had occurred during the dyadic mixed-gender arguments was tabulated and elaborated upon. Research question 2 is answered by investigating the differences and similarities of male and female participants in the application of critical thinking in the verbal argument.

**4.1 Critical Thinking Elements**

The findings of the data, drawn from the verbal arguments, have been transferred into table and graph forms. The data analysed were gathered from four selected dyadic mixed-gender groups. Three groups were made up of 2 male participants and 2 female participants, and one group was made up of 3 male participants and 1 female participant.

Figure 4.1 shows the overall results of the six elements that were displayed in all four groups. Claims are opinions, ideas or statements that were not supported with reasons or evidence, hence it cannot be counted as an argument (Stapleton, 2002). Out of the 102 claims found from the data, 23 (22.6%) were valid arguments, and 29 (28.4%) were fallacies (invalid arguments). Within the valid arguments, 40 reasons (39.2%) and 10 evidence (9.8%) were found. Out of the 23 valid arguments, 13 (12.7%) were counter-arguments. A counter-argument is produced to oppose the opponent's arguments or defend the own position of their own argument (Stapleton, 2002).
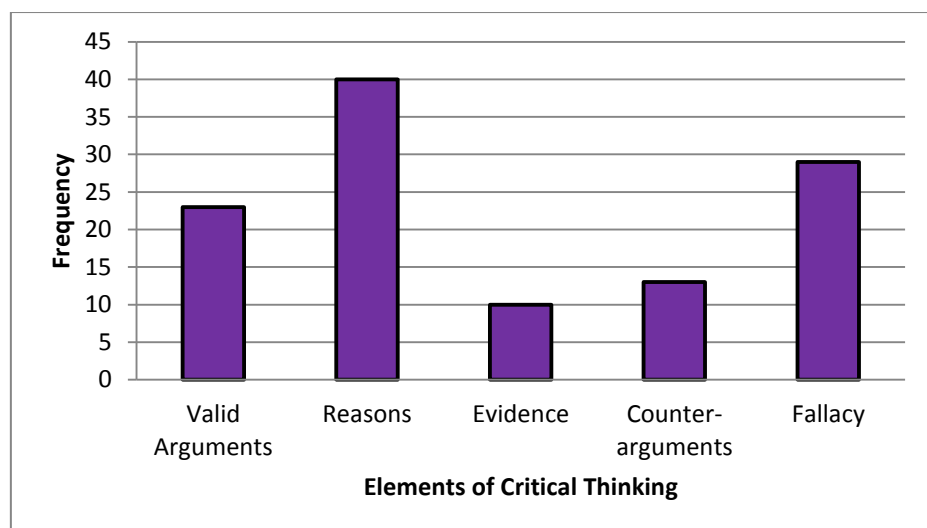
Figure 4.1: Frequency of Critical Thinking Elements

The result in Figure 4.1 revealed that the number of valid arguments generated by the participants in total were 23. According to Epstein (2002), an argument is made up of claims which one is the conclusion and the others are the premises. The finding of valid arguments used in the verbal arguments implies that critical thinking skills were displayed when the participants were argumentatively reasoning with each other in their group.

However, it was found that the number of valid arguments were 5 times lower than the claims that were put forth. With the high number of claims detected, it can be inferred that the participants did not substantiate their conclusions with plausible reasons or with relevant reasons. For a claim to be a valid argument, it needs to be supported with logical reasons and evidence (Brink-Budgen, 2007). Hence, a claim without reasons and evidence, it will remain as an opinion and not a valid argument. This makes the position taken by the participants as well as the overall case of the argument established to be weak.

From Figure 4.1, it can be seen that the number of fallacies detected is higher than the number of valid arguments. In any arguments, it is natural for the number of fallacies to be higher (Kuhn, 1992). According to Stapleton (2002), if the number of fallacies generated are significantly higher when compared to the number of valid arguments, then it is indicative that the reasons or evidence stated are irrelevant or illogical to the conclusions provided. However based on Figure 4.1 above, the ratio between the number of valid arguments and fallacies found are 1:1.31 and this is considered to be relatively small, (Stapleton, 2002).

## 4.2    Valid Arguments

According to Stapleton (2002) for an argument to be valid it should consist of reasons or evidence to support the claim that it is inferring to or also known as the conclusion. The reasons or evidence provided should be plausible and relevant to the conclusion that it is seeking to affirm.

Table 4.1 Frequency count of Valid Arguments

| Group | Male participants | Female participants |
|-------|-------------------|---------------------|
| Group 1 | 3 | 4 |
| Group 2 | 0 | 3 |
| Group 3 | 5 | 1 |
| Group 4 | 3 | 4 |
| **Total** | **11** | **12** |

Based on Table 4.1, it can be seen that a total of 23 valid arguments was found from the four groups who took part in the study using Stapleton (2002) framework. The participants were able to bring forth between 3 to 7 valid arguments within the 10 minutes that were allotted for each group. From Table 4.1, it can be deduced that overall the male participants were able to provide 11 valid arguments and the female participants brought forth 12 arguments. It can be deduced that the female participants were able to produce more valid arguments as compared to the male counterparts. The findings were found to be similar to Ricket and Rudd (2004); Aybek and Aldag (2009).

With reference to the extract below, the valid argument was selected from one of Group 4's verbal argument. G6 (a female participant) had responded clearly with plausible reasons to B8 (a male participant)'s argument on the differences of marks allocation for the physical fitness assessment

conducted in schools. In extract 1, the valid arguments are highlighted in bold and the reasons and evidence are underlined.

**Extract 1**

| 86 | G6 | So I think that if. (C) **if the girl is determined you know to play** |
|----|----|-----------------------------------------------------------------------------|
| 87 |    | **well in sports and she really want to excel well in sports**. **the girl** |
| 88 |    | **CAN play well in sports**/ No DOUBT umm. he's saying that guys |
| 89 |    | umm. maybe urm. (R1) <u>the marks allocated for the guys and girls are</u> |
| 90 |    | <u>different just because umm in this age we girls don't really umm put</u> |
| 91 |    | <u>interest in sports</u>/ But if we were to put. (R2) <u>if we were to umm.</u> |
| 92 |    | <u>want to excel this sports area. we can do well</u>/ Because umm. yea. |
| 93 |    | because ah okay. (E) <u>example Nicole David. she uh. she she she play</u> |
| 94 |    | <u>squash</u>/ She can play umm. as as well as guy/ Umm. if girls were./ So |
| 95 |    | my main point is if girls want to play well in sports. girls can do it/ |

In the extract, there were two reasons and one evidence stated to support the conclusion (see bold). A conclusion is a claim that is intended to be established in an argument (Stapleton, 2002; Kirby and Goodpaster, 2007). In this argument, the conclusion is mentioned in the beginning of the argument which is 'girls can excel in sports if they are determined to play well'. G6 reasoned that the marks allocated in schools are different for male and female students because in this generation girls do not have much interest in sports. However, she affirmed that girls can excel in sports if they choose to do so out of their own willingness and interest. G6 also provided an evidence to strengthen her conclusion further. She stated that woman such as Nicole David, who is a Malaysian professional squash player, was able to excel in sports because she wanted to play well in sports. This shows that G6's argument was valid as she used relevant evidence and logical reasons to support her conclusion.

**Extract 2**

| 144 | B5 | I like. I like to got. add another point that. you said that uh. it's |
|-----|----|----|
| 145 | | proven that most. of the (C) **boys are brutal. are vulgar or more** |
| 146 | | **violent** on uh. managing their things/ But let me tell you. do you see |
| 147 | | those kinds of people study into universities and getting great |
| 148 | | certificates to uh. go and manage their own companies? I don't think |
| 149 | | so. **I don't think most of the boss today are like that**/ But most of. |
| 150 | | (R1) <u>most of the boss who succeeds in making it up to their top</u> |
| 151 | | <u>place. they have professional skills. they're more rational</u>/ So that |
| 152 | | means they (R2) <u>know how to study well so they get better results in</u> |
| 153 | | <u>order to get to such high place.</u> So uh. uh. I'd like to tell you that- |

In extract 2, another valid argument was identified and extracted from Group 3's verbal argument. This argument is a counter-argument made against the opponent, G5. In this argument, B5 rebutted the opponents' claim that 'most male bosses who held high positions were domineering and ran their company with harshness'. In other words, they were not 'emotionally equip'. B5 rebutted and drew the conclusion that 'not all male bosses are brutal, vulgar or violent in managing their company'. B5 reasoned that most male bosses who succeeded to the top were because of the professional skills that they possessed. B5 also mentioned that these bosses held high positions because they have studied hard and have obtained good grades in school. So, this shows that B5 were able to rebut the opponents' claim using arguments that are valid as the reasons provided are plausible to the conclusion (Stapleton, 2002; Epstein, 2002)

From the analyses, it was found that there were other varieties of valid arguments found in all the groups' verbal arguments. Both Group 1 and Group 4 managed to each produce 7 valid arguments. These two groups were found to be capable of drawing distinct conclusions which were substantiated with

plausible reasons and evidence (refer to Appendix J). The distinct conclusions that were drawn by Group One were: (a) teenagers need a stable income before getting involve into a boy-girl relationship, (b) the maturity level of teenagers, who are in relationship, is questionable, (c) teenagers are not ready to enter into a relationship as they do not have the money to set up a family of their own yet, (d) dating is a waste of time (e) it is possible for teenagers to enter into a relationship at this age (f) going on dates are waste of money, and (g) teenagers do need an income to be in a relationship. This shows that out of the 23 valid arguments, the participants from Group 1 and 4 managed to 7 valid arguments respectively.

Group Two likewise managed to produce 3 distinct types of arguments. All the valid arguments in this group were brought forth by G4 which were: (a) boys spend money unnecessarily, (b) boys do not compare prices before making purchases, and (c) ladies manage their household money better than men. This implies that arguments found in the verbal argument were fallacies as most were hasty generalisation (refer to Appendix K).

On the other hand, all the valid arguments found in Group Three were from male participants who produced a total of five valid arguments and the female participant did not manage to establish any valid argument. Both B7 and B5 managed to each produce two arguments that were valid, and B6 had one valid argument. Group 3 reasoned that: (a) girls are more motivated to perform better than guys in a company, (b) girls continuously improve themselves in their career as bosses, (c) not all male bosses are brutal, vulgar or violent in managing their employees, (d) the main criteria to be a boss is to have some proven qualification to take up the position and handle the job well,

and (e) being dominant in holding high position is good. This shows that out of the 23 valid arguments, Group Three was able to established 5 valid arguments.

Group Four had 7 valid arguments in their verbal argument. They were mostly produced by G6 and B8, who respectively produced 4 and 3 valid arguments respectively. G6 argued that (a) girls can play sports equally well as guys, (b) girls are able to undergo the same training as boys, (c) girls can excel in sports if they are determined to play well in sports, and (d) girls have the same set of organs to be equally good in sports as boys. B8 on the other hand argued that: (a) girls are not on the equal level in sports, (b) girls in general do not do in sports and (c) girls lack interest in sports activities. This shows that most of the valid arguments established in this group were produced by the female participants.

## 4.3    Evidence

In all the four conversations, there was quite a number of evidence which were used by the participants in order to support their arguments. According to Stapleton (2002) evidence is an element of critical thinking which is used to strengthen a conclusion that is intended to be established. With reference to Figure 4.2, it was noted that male participants provided more evidence to strengthen their arguments as compared to female participants.
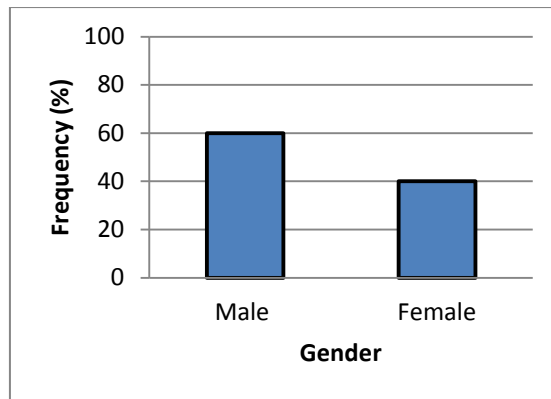
Figure 4.2: Frequency count of Evidence

In the discussion, participants were found to use four types of evidence, which are: facts, personal experience, pointing out consequences and comparison analogies. There were 10 distinct pieces of evidence found from the four verbal arguments (refer to Appendix J). The form of evidence that were used most in all the verbal arguments was 'fact' (see Chapter 3). The extract below illustrates a fact of how one participant used Nicole David (see bold), who is a professional squash player, as a fact to support that girls can play sports equally well compared to boys.

**Extract 3**

| 91 | G6 | / But if we were to put. if we were to umm. want to excel this spots |
|----|----|----|
| 92 |    | area. we can do well/ **(E) Because umm. yea. because ah okay.** |
| 93 |    | **example Nicole David. she uh. she she she play squash**/ She can play |
| 94 |    | umm. as as well as guy/ Umm. if girls were./ So my main point is if |
| 95 |    | girls want to play well in sports. girls can do it/ |

**Extract 4**

| 241 | B5 | first define what boss means. |
|-----|-----|---|
| 242 | | what boss mean/ Because boss doesn't necessary means that he's the |
| 243 | | one. toppest one. the one on the top. but boss means that maybe uh. |
| 244 | | teacher is our boss now because she's in a way uh. higher than us/ |
| 245 | | Then the principal is uh. teacher's boss now. because in a way the |
| 246 | | discipline. the principal is higher than her/ So get what I mean? |

In extract 4 which is displayed above illustrates another type of evidence which is known as a comparison analogy. Comparison analogy uses another similar case to illustrate the current reason or evidence clearer (Stapleton, 2002). The participant, B5, argued that the position of a boss does not necessary hold the highest position is analogous to the position of a teacher in a classroom, who may be the highest authority in class but not necessary holds the highest position in the school organisation. This evidence is used to support the conclusion which proves that qualifications are needed to take up higher position. This illustrates that B5 is capable in supporting his conclusion using an analogy on positions held by staff in a school to staff's positions in a company.
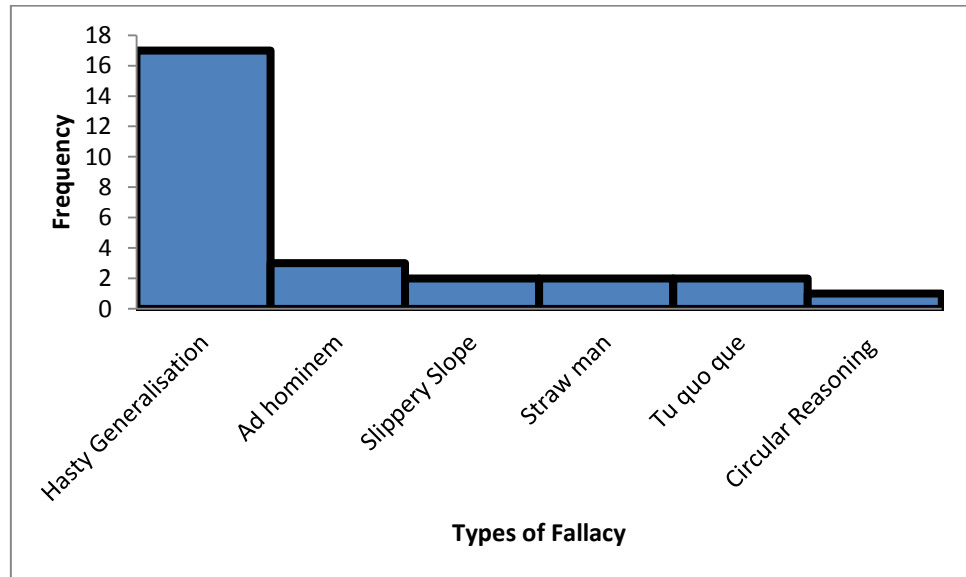
## 4.4 Fallacies



Figure 4.3: Frequency of Fallacy

Based on Figure 4.3, the analysed data shows that there are nine types of fallacy which were used by the participants. The results show that the fallacy of hasty generalisations (17) was the highest. This is followed by ad hominem (3), slippery slope (2), straw man (2), tu quoque (2), and circular reasoning (1). There was no fallacy of false dilemmas or appeals to popularity that found in the data.

The fallacy of hasty generalisations served as the highest fallacy indicates that the participants did not provide substantial amount of evidence or reasons to support the claims that they proposed. These findings support the findings of Ramasamy (2011) who did a thorough study on fallacies made by Malaysian participants.
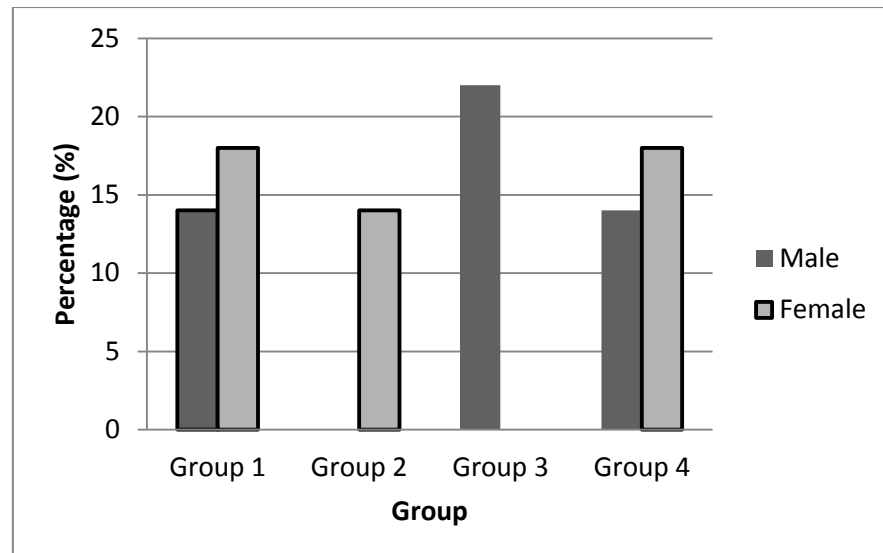
Figure 4.4: Comparison of fallacy between male and

female participants

In trying to discuss if there are gender differences, Figure 4.3 illustrates that male participants (60%) have higher numbers of invalid arguments as compared to the female participants (40%). This indicates that the male participants made numerous fallacious claims in their argument and did not provide plausible reasons or evidence to the conclusion that were drawn. This may imply that the male participants, who were eager to argue, failed to provide relevant reasons to support the claims which they had intended to establish. The female participants reasoned better as they were able to justify and defend their claims with plausible reasons and evidence when they were challenged by their opponents. Therefore, male participant made more fallacious arguments compared to the female participants.

Accordingly, the highest number of fallacy was made by B4 (21%) and this followed by B9 (14%). All the fallacies made by B4 were hasty generalisations. This could imply that B4 claims were not backed with reasons or valid evidence that were relevant. When statements are hastily generalized

then it implies that B4 was merely expressing his opinions and so it cannot be accepted as an argument because they were not justified and strengthened with reasons and evidence.

On the other hand, B9 committed three types of fallacies. The types of invalid arguments made by B9 were: circular reasoning, straw man, tu quoque and hasty generalisation. The three types of fallacies committed indicate and suggest that B9's claims were intended to undermine the opponent's view, but the claims were unjustified. Therefore, his arguments were not substantiated. This implies that B9 was throwing accusation or making judgements that were not true

### 4.4.1 Hasty Generalization

Hasty generalisation is a statement made about a situation which is an opinion where the number of evidence provided is too small to warrant a conclusion or they may have been no reasons provided to support the conclusion (Kirby and Goodpster, 1995).

**Extract 5**

| 22 | G1 | I mean have a permanent work/ Have a stable income? I guess all of |
| 23 | | you don't have [right. |
| 24 | A | [I got ((XX)) |
| 25 | G1 | So. er . er for us to enter a relationship you have to pay for the like. you |
| 26 | | know. you have to eat right. Then you have to go *pak tao* right. and |
| 27 | | everything. so you have to pay for the bills. you have to. you know. |
| 28 | | like drive you drive your girlfriend. you drive your girlfriend here and |
| 29 | | there. And then all this need money and don't tell me you use your |
| 30 | | dad's money/ And your pocket money come from your parents also. so |
| 31 | | it's you who want dating the girl or your parents dating the girl?/ |
| 32 | G2 | **(F) And our mental is not fully developed as we enter a relationship** |
| 33 | | **now. urm. I think our will not concentrate in our studies [when** |
| 34 | | **they are in a relationship]. umm. (F) nowadays they are very. they** |

| | |
|---|---|
| 35<br>36 | **are many girls run away from home just because of guys/(F) In this way their study is not concentrated and I think their future is. ur. will ur. be really - affected /** Yeah. that's all/ |

In extract 5, the participant presented an argument which is considered as a hasty generalisation (see bold). The conclusion that can be drawn from G2's argument states that 'teenagers are not ready to be in a relationship'. However, the premises presented did not support the argument and were over generalized to the population of all teenagers. G2 had stated that 'all teenagers' mental developments have yet to be fully developed' and 'this has in general affected teenagers' concentration in their studies' when they are involved in a relationship. In reality, there are many reasons why teenagers do not concentrate on their studies although an involvement in a relationship could be the cause. This premise as provided by G2 can be valid and true if adequate evidence from other studies or research done on teenagers' mental development were presented to prove that they are indeed not ready to be in a relationship. However, in this case, the reasons provided by G2 which states that teenagers cannot 'concentrate in studies if they are involved in a relationship' cannot be generalized to all teenagers and this argument is considered to be invalid or fallacious.

The other premise that was brought forth by G2 was that many teenage girls today ran away from home because of their involvement in a relationship. This reason, however, is not applicable to the vast majority of girls who choose to run away from home for various other reasons. Therefore, this premise is also a hasty generalization. This shows that G2 generalised that all

girls who ran away are linked to their involvement in a relationship and fail to provide any reasons or evidence to support the conclusion.

**Extract 6**

| 66 67 68 69 | B7 | But. I still think they can handle a job better because even with all those they have learnt how to cope with this situation for 20 over 30 over years. And what guys do. guys only know how to. guys only know how to express their anger/ uh. yeah/ |
|---|---|---|
| 70 | B5 | \<speaks in Chinese\> |
| 71 72 73 74 75 | G5 | Oh. besides right. uh. umm thinking that **(F) girls make a better boss because for example. uh. uh. for example. okay. we only hear that guy guy bosses seduce. or they have. they seduce their secretary  they have. they have relationship with their secretary and stuff like that/ (F) But we don't hear a lady boss will have uh.  an affair with HER. secretary**/ |
| 76 | Crowd | Who say? |
| 77 78 | G5 | Okay. so basically we think that girls make a better boss la. because. mm. uh. |
| 79 80 | A | \<whispers\> Nasi lemak/ |

Based on extract 6, G5 claimed that 'girls make better bosses' (see bold) and the reason given by G5 was that lady bosses do not seduce their secretary and have affair with her secretary. This is also a hasty generalization as the reason provided cannot prove that the claim is valid as there is no adequate evidence provided from reliable sources. This shows that there is also no correlation between the reason and the claim is intended to create.

### 4.4.2   Circular Reasoning

Circular reasoning is an argument circulating around whereby the reason and the conclusion are identical (Freeley and Steinberg, 2009). Circular reasoning often takes the following the form: "A is true because B is true; B is

true because A is true" (Freeley and Steinberg, 2009). This fallacy is found in Group 4 discussion.

**Extract 7**

| 112 | G6 | I think he said is agreeing with my point/ Because he said umm. |
|-----|-----|-----------------------------------------------------------------|
| 113 |    | Nicole David umm has proper training/ So that means he actually |
| 114 |    | trying to say that if girls were to go under proper training. we can |
| 115 |    | play well in sports/ |
| 116 | B9 | Well. you know that Roger Federa has more fans than your what |
| 117 |    | Nicol David. |
| 118 | G6 | I don't. I don't think that is link to the topic. Can you give another |
| 119 |    | stronger point. |
| 120 | B9 | Well. you know the world has prove it you know always male. |
| 121 |    | male sporter. |
| 122 | Crowd | Supporter \<laughs at B9 mispronunciation of the word 'supporter'\> |
| 123 | B9 | \<looks at B8 for help\> **(F) male. sporter. at least. at least I learn** |
| 124 |    | **English. umm, has more fans than the female one/ Why?/** |
| 125 |    | **Because they play well/ They can play MORE interesting than** |
| 126 |    | **the FEMALE one/ So. audience right "WOW! shock!" but the** |
|     |    | **female one "Wow! sexy."/** |
| 132 | B9 | Why. wait wait wait wait wait. You know why male. **(F) male** |
| 133 |    | **athletes have more fans than female ones? Because male. male** |
| 134 |    | **can. male. male athletes can.** don't disturb LA/ |
| 135 | Crowd | \<laughs\> |
| 136 | B9 | **Male athletes can perform better than the female one**/ So |
| 137 |    | audience like to see male playing a sport more than a female one/ |

Based on Extract 7, B9's argument is that male athletes can perform better than female athletes because male athletes have more fans than female athletes. According to B9, this shows that male athletes can play better and more interesting than female athletes. This is a circular reasoning as it cannot prove that male athletes perform better in sports compared to female athletes. It also does not contain evidence that is logical and distinct from the conclusion of the argument. Therefore, B9's argument is considered fallacious.

### 4.4.3 Straw Man Argument

Straw man argument occurs when an irrelevant or illogical issue set up merely to knock it down. If an opponent chooses to refute the issue, it would make the opponent look irrational. It can be seen as a strategy use to trap the opponent for being irrational (Freeley and Steinberg, 2009; Walton, 1996).

**Extract 8**

| 55 56 57 | G1 | Okay. I ask you. how are you going to go to the seaside? Are you going to walk from Klang to Port Klang? Or are you going to walk from Klang to Pulau Pinang? |
|---|---|---|
| 58 59 60 61 | B1 | **(F) So you are just trying to use. we don't know how to earn money so you are trying to use this reason to oppose. but we don't know how to earn money doesn't mean we don't need to eat. we don't need to drink. we don't need to go to school/** |
| 62 63 | G1 | No/ Because. it's like if you enter a relationship you are actually going to// |
| 64 | B1 | //anything [to cause. |
| 65 66 67 | G1 | [you are. you are. stop. wait! You are getting yourself ready to. urm. you know form a family and. and all this need money/ |

In extract 8, B1 refuted G1 for mentioning that teenagers should not enter into a relationship as they do not earn an income. B1 argued that teenagers should not eat, drink or attend school since they have no income to buy their food and pay their school fees. B1 refuted by providing irrelevant reasons so as to reduce G1's argument to absurdity. It would seem illogical for anyone to agree with G1's argument after it is reduced to absurdity. B1 opposed G1's deliberate attempts to weaken the opponent's argument. This distortion of the opponent's argument is known as a straw man argument. In a way, B1 did not oppose G1's argument with any relevant evidence or reasons to justify that teenagers can be involved in a relationship without having to earn any income, but an alternative counter

position, which were claims that were unjustified with reasons and evidence, was provided instead. G1 did not mention that teenagers should not eat, drink or attend school since they do not earn an income.

### 4.4.4   Ad Hominem Argument

Ad Hominem argument is use to attack the character of the opponent who is advancing their argument rather than the argument that the opponent state (Freeley and Steinberg, 2009).

**Extract 9**

| 187 188 | G1 | **B1 because urm. he is. you know. currently infatuated by. little girls/ And when teacher is teaching in class. he will//** |
|---|---|---|
| 189 | A | //OBJECTION! |
| 190 191 192 193 | G1 | No. I mean. oh. when someone is in love in some one. when the teacher is teaching in class. I'm just giving an example la okay. then you will do like other things in class rather than listening to what teacher is teaching on// |

In extract 9, G1 was trying to counter B2's argument by providing evidences of how teenagers who are in a relationship do not excel in their studies as they are unable to focus in class (see bold). The evidence that G1 provided to support the argument was an issue about B1. G1 stated that B1, who is currently infatuated with little girls, was not able to pay attention to the school lesson. This is considered as a type of an invalid argument which is known as ad hominem. It is fallacious because the evidence provided was used to attack the opponent on a personal matter rather than addressing the substance of the argument.

**Extract 10**

| 43 | B9 | Okay. first of all. I would like to say that I cannot imagine a girl |
| 44 | | with a 6 packs/ **(F) Yea. girls always like umm. make their self** |
| 45 | | **pretty and not muscular and they like like jelly fish you** |
| | | **know/** |
| 46 | Crowd | OHHH |
| 47 | B9 | Shhh – **(F) So. boys eh guys is more suitable for this kind of** |
| 48 | | **muscle building training or physical training anything and.** |
| 49 | | **what I would like to say eh state is you know. the world's** |
| 50 | | **most famous sport is football right?/ And I'm sure you've** |
| 51 | | **heard about FA Cup. Not B cup not A cup. FA Cup**/ <G6 |
| 52 | | stares at B9> Okay well FA Cup we always. see that. guys versus |
| 53 | | guys/ We never see that guys and women together one team. |
| 54 | | versus another of guys and WOMENS/ <B9 jeers at the girls> |

In extract 10, B9 undermined G8 for stating that both female and male students have the same muscular system. G8 also stated that female students can be equally as built up as male students if they choose to go through the same amount of training that male students do.

Instead of addressing the issue of G8's argument with logical arguments, B9 undermined G8 using irrelevant evidence. He stated that girls' muscular build are similar to a jelly fish. He added that even The Football Association Challenge Cup (FA Cup), which is a world famous football competition, consists of only male players and not women's brassiere sizes. This is also known as an ad hominem argument as the evidence stated did not address G8's argument but rather it was a personal attack on the gender of G8, who is a female student.

**4.3.5 Slippery Slope**

Slippery slope argument uses a chain of conditionals some or many which are dubious to reason and establish an issue (Epstein, 2002). Brink-Budgen (2010) states that this fallacious argument follows this structure: 'If A, then B; if B then C; if C then D… if P, then Q. So, if A then Q has to happen.'

**Extract 11**

| 168 | B1 | So why. why to be in a relationship is wasting your time? |
|---|---|---|
| 169 | G1 | wasting our time.  [ Because now we are |
| 170 | B1 | [we can. we can. yes. we can share secrets with |
| 171 | | others // |
| 172 | G1 | **(F) // because now we are a student/ Our first priority is to** |
| 173 | | **study and have a bright future/ If you think studies is not** |
| 174 | | **important. you go into a relationship then you are neglecting** |
| 175 | | **your future/ Without a good future. you cannot give your** |
| | | **girlfriend a very good life in the future/** |

In extract 11, G1 refuted B1 that being in a relationship is a waste of time, while B1 was reasoning that being in a relationship does not necessarily need to cost any money. G1 refuted B1 with an unrelated claim to the argument. G1's argument is considered as a another type of an invalid argument called slippery slope argument. G1's argument was that being in a relationship is a waste of time. One of the premises provided is that a student's priority is to study hard and have a bright future. If one chooses not to study and go into a relationship, then the student is neglecting his or her future. Then, this may lead one to a bad future because the student will fail to provide a good life for his girlfriend in the future.

G1's reasoning seems logical but the premises provided do not support the argument that being in a relationship is a waste of time. G1 provided a condition in her premise that if he or she who chooses not to study and go into a relationship will lead to a series of disastrous consequences such as not having a good future and failing to provide for their love ones. This premise is not true and valid as being in a relationship does not necessarily mean that one will definitely choose not to study and neglect their studies. It is a slippery slope argument because the decision or course of action taken in choosing to enter a relationship will lead one to something unacceptable, wrong or disastrous. It also shows no obvious connecting points in the argument in taking one from the point of not necessarily needing money to be in a relationship to wasting time being in a relationship and to finally to not having a bright future. This argument is clearly a slippery slope argument.

### 4.3.6  Tu Quoque

This argument is a fallacy and it often takes this form: "1) Person A makes claim X; 2) Person B asserts that A's actions or past claims are inconsistent with the truth of claim X: and 3) Therefore X is false" (Brink-Budgen, 2007).

**Extract 13**

| 190 | G1 | No. I mean. oh. when someone is in love in some one. when the |
|---|---|---|
| 191 | | teacher is teaching in class. I'm just giving an example la okay. |
| 192 | | then you will do like other things in class rather than listening to |
| 193 | | what teacher is teaching on// |
| 194 | A | // like what you did in class la?/ |
| 195 | G1 | and this is the kind of. I would say – irresponsi[ble! |
| 196 | A | (F) [but it's better |

| 197 | | **than sleeping right?/** |
|---|---|---|
| 198 | Crowd | \<laughs\> |
| 199 | G1 | Yeah. sleeping also/ If you cannot take care of YOUR life. then |
| 200 | | what. what for want to take care of other people life/ ((XX)) I'm |
| 201 | | not in a relationship/ |

In extract 13, the discussion of this argument in this extract began with G1 claiming that when a male student is in love, he will not be able to fully concentrate in the lesson. This is because he will be distracted with matters over the girl that he is interested in, and G1 stated that it is irresponsible for a student not to concentrate in class. However, a student from audience interrupted the discussion and asserted that G1's action of sleeping in class was also equally an irresponsible act. In this way, the student from audience pointed out that G1's argument was inconsistent with her own actions. Therefore, this made G1's claim invalid.

## 4.5    Summary

This chapter has covered the analysis of the elements of critical thinking found in the four groups' verbal argument. The analysis and interpretation of the similarities and differences between the male participants and female participants were presented in the following section. In the next chapter, a summary of the main findings are discussed and suggestions for future research on critical thinking.

# CHAPTER 5

# CONCLUSION AND RECOMMENDATIONS

## 5.0    Introduction

This chapter discusses the conclusion of the study undertaken to investigate the critical thinking elements found in Malaysian teenagers' arguments, and to examine if there are differences or similarities in which male and female students express their arguments. The conclusion drawn from the findings of the study are discussed first. Finally, the implications of the study are highlighted and some recommendations for further research are suggested in the final part of this chapter.

## 5.1    Discussion

In the past many empirical studies on critical thinking have focused largely on the thinking in which people employ in a work context (Rosyati AR. & Rosna AH. 2008, Perlmutter, Kaplan and Nyquist, 1990; Ricket and Rudd 2004). This is a rational starting point to observe as for most people work is often the most challenging part. If, in a relaxing situation, someone were to ask a question on an important social issue which requires the individual to justify his or her claim, will the person than be able to reason the claim as he or she would in a formal situation? Educationists and parents would definitely aspect their students or children to be able to perform and reason well. Therefore, the purpose of this study is to investigate whether Malaysian teenagers are able to display elements of critical thinking in a verbal argument with their peers. Another aim of this study is determine

whether there are similarities or differences in the display of critical thinking elements in relation to gender as they have a wide range of literature to propound that men and women do not think similarly (Facione, 1990; Aliakbari, M., & Sadeghdaghighi, A., 2011; Rodriquez, 2000; Facione, Facione and Gainen 1995).

This study was carried out in a Chinese Independent school where the participants selected for this study consisted of nine male students and seven female students. All the students were of Chinese ethnicity and were between the ages of 17 to 18 years-old. Students were placed in groups of four. Each group consisted of two male participants and two female participants with exception of one group which consisted of three male participants and one female participant. The numbers of male students were more than the numbers of female students in this class, therefore the number of male and female students in this group could not be divided equally.

The topics given to each group contained highly sensitive issues and had controversial implications. The participants were allowed to discuss on the topic and argue their differences through reasoning, justification and rebuttal. All the four groups were video recorded during the verbal argument session and the arguments were later transcribed orthographically (Jefferson, 1979). Sinnott-Armstrong's Reconstruction of Argument Model (2009) and Stapleton's Element of Critical Thinking Structure (2001) were then used to analyse qualitatively on the application of critical thinking in verbal arguments. Then the result of the analysis were used to determine whether there is any significant correlation between gender and the elements of critical thinking employed.

### 5.1.1 Discussion of Research Questions

Research Question 1:

*What are the critical thinking elements seen in Malaysian teenagers arguments?*

This research was undertaken to establish that Malaysian teenagers are able to think critically in conditions where their beliefs and opinions were probed and when their claims had to be defended through plausible reasoning. It was found that the elements of critical thinking were evident in their verbal arguments. In contrary to the findings from various scholars that Asian students are not able to think critically were proven to be not true as the results of the present student indicated otherwise. However, the numbers of valid arguments presented were relatively lower than the claims that were made during the verbal argument. The low numbers of valid arguments revealed that the display of higher order thinking skills were not strong. If more claims were substantiated with plausible and valid reasons, then the number of valid arguments would have been higher.

In the evaluation of the evidence, it was found that a variety of types of evidence were found. The broad variety of evidence used in the arguments included facts, personal experience, pointing out consequences and analogies. This findings suggested that students had some intuitive understanding of what constitutes legitimate proof that were needed to strengthen their arguments or refute their opponents in a more definitive manner.

In an informal social dialogue, it is natural that the number of fallacies to be higher than valid arguments. From the results, it was also found that the fallacious arguments committed were three times higher than the valid arguments presented. The ratio of the valid arguments and the fallacies made by each student were 1:3. Fallacies of several different categories can be found in the four groups' verbal argument namely: hasty generalisation, circular reasoning, tu quoque, ad hominem, straw man and slippery slope. This finding denotes that participant in their eagerness to support and defend their claims have failed to recognize that they had gone beyond a point of reasonableness.

Interestingly, the fallacious arguments were found mostly when the participants had to defend the position of their arguments and when they had to present their counter-arguments against their opponents. When the participants were establishing their case or presenting new ideas, the numbers of fallacies committed were low. This finding suggests that students lack the exposure of an "open" discussion environment where topics involving values or morality can be openly and genuinely debated without being heavily controlled by the teacher. From the result, it can also be drawn that the participants did not anticipate their argument to be rebutted and the spontaneous response that were required to be generated in the short span of time.

From the findings of the data, valid arguments were found and thus it can be deduced that teenagers have the ability to reflect on their own thoughts. This supports Piagetian formal operation that an individual is able to handle more complex issues and situations between the ages of 11 to 17.

Research Question 2:

*In what ways are male and female students similar or different from each other in expressing themselves in verbal arguments?*

Results from the present study inferred that the female participants provided higher number of valid arguments and evidence compared to the male participants. From the present study, the qualify differences may be linked to the fact that the female participants were able to provide more relevant and plausible reasons to the conclusion compared to the male counterparts. However, both male and female participants shared the similarity in committing the same category of fallacy the most which was hasty generalisation.

The conclusion of this study is further supported by the work of Walsh and Hardy (1999) who conducted a study on 334 male and female students. It was found that there were statistically significant differences between male and female students. It concluded that female students displayed higher level of critical thinking abilities compared to their male counterparts.) Other researches have also found similar (A.M Dato, Tapsir & Kathiravelu, 2004; Ricket and Rudd, 2004). However, many researchers have argued that are no significant gender differences in the display of critical thinking (Kuhn,1992; Kawashima & Shiomi, 2007; Ismail, Abdul Aziz, & Husin, 2007). The findings of the present study should not be taken as conclusive due to the number of samples that were undertaken were not significant.

## 5.2   Implications

The findings of the present study imply that more work needs to be done towards enhancing the thinking skills of secondary students. In order to expediently maximize the development of thinking in schools, the Education Ministry needs to re-evaluate the effectiveness of the present curriculum and teaching practices particularly pertaining to critical thinking. More educational programmes should be constructed to engage students in the practice of thinking especially through expressing their thoughts and exchanging opinions with one another and not merely focusing on teaching students about good thinking.

According to Kuhn (1992) many people have the cognitive skills in the implicit form, but a large amount of reinforcement and sharpening of the skill is needed before it can appear in the explicit form. So, one method of developing students' ability to think is through engaging them in practice. Schools should conduct social dialogue in a classroom setting as illustrated by the verbal argument research done in this study. It can serve as an ideal way of fostering good thinking skills. It offers students the opportunity to externalize argumentative reasoning when their belief or opinions are probed. Thinking as argument is embroiled in all the beliefs and opinions people hold, the judgments or criticisms they make, and the decisions they come to. Hence, the need to enhance critical thinking should be made a priority.

An education system that promotes life-long learning and good thinking habits is to meet the demands of the job market both locally and intentionally is pivotal. If the numbers of critical thinkers increase in

Malaysia, the country will be able to stand at par with their counterparts in all aspects of the economy as substantial contribution to the nation will be made when they become part of the human resource. This will help sustain the economic prosperity and realize the desire of Malaysia to become a develop nation.

## 5.3    Suggestions for future research

Since the participants in this study only consisted of 16 male and female students of a secondary school, a similar study should be carried out at a broader scale. Other ethnicity in Malaysia should be selected to be part of the study. Besides that future research should also focus in measuring critical thinking elements of different proficiency level and age groups.

## 5.4    Conclusion

The result of this study proved that the elements of critical thinking were indeed evident in teenagers' verbal argument. Nevertheless, the use of critical thinking does strong prevail in their arguments. Therefore, an environment in which thinking can be fully developed before an individual step out into the workforce is crucially needed. Individuals would then be able to employ it in their everyday life more effectively once these skills have been ingrained into them implicitly.

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