UNIVERSITI PUTRA MALAYSIA

EFFECT OF SCAFFOLDING SOCRATIC QUESTIONING TECHNIQUE ON THE DEVELOPMENT OF L2 STUDENTS' CRITICAL THINKING SKILLS IN READING

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By

NURSHILA BINTI UMAR BAKI

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Master of Arts

May 2021

Dedicated to

Saiful Bakhtiar bin Samsudin

and

my sunshine

Nurul Batrisyia Husna binti Saiful Bakhtiar

Muhammad Hamiz Imran bin Saiful Bakhtiar

For believing in me.

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Arts

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Chair : Vahid Nimehchisalem, PhD
Faculty : Modern Languages and Communication

Language and critical thinking are vital skills needed in the 21st century especially with the emergence of the Fourth Industrial Revolution (Industry 4.0). Both skills complement each other. As one engages in critical thinking, the language skills develop as one continues to probe for reasons and explore a topic Previous studies demonstrated the significance of promoting thinking skills, particularly critical thinking in the L1 context. Positive changes in terms of subjects' achievement and attitudes were observed. Recent trends in L2 context have attained similar results. On the contrary, students have become passive learners and are not used to complex thinking skills due to rote-learning, teacher-talk and the exam-oriented system practiced in most Malaysian classrooms as well as in Asian ESL context. Thus, this study attempts to evaluate the potential of scaffolding Socratic questioning strategies in reading as a method to develop students' critical thinking skills. This quasi-experimental pretest-posttest study involves fifty-eight Form 4 students from a secondary school located in Johor, Malaysia. Students were assigned to control and treatment groups and tested at the beginning and end of a nine-lesson intervention comprising scaffolding Socratic questioning in reading activities. ANCOVA was used to measure within-group variations for the EG and CG scores as well as an independent t-test via the Levene's t-tests for the Equality of Variance was also conducted to test the differences of scores between the two groups. Data attained from the Cornell Critical Thinking Test Level X indicated development on participants' critical thinking skills. The results indicated that employing critical thinking skills in reading activities has a statistically significant effect on students' critical thinking skills. The findings have useful implications not only for researchers but also for practitioners and the English learners that critical thinking plays a vital role in reading comprehension instructions.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sastera

KESAN PENGGUNAAN STRATEGI PROSES BANTUAN SOALAN SOCRATIC TERHADAP PEMBENTUKAN KEUPAYAAN BERFIKIR PELAJAR MELALUI PEMBACAAN

Oleh

NURSHILA BINTI UMAR BAKI

Mei 2021

Pengerusi : Vahid Nimehchisalem, PhD
Fakulti : Bahasa Moden dan Komunikasi

Bahasa dan pemikiran kritis adalah kemahiran penting yang diperlukan dalam abad ke-21 terutamanya dengan kemunculan Revolusi Perindustrian Keempat (Industri 4.0). Kedua-dua kemahiran ini saling melengkapi. Apabila seseorang terlibat dalam pemikiran secara kritis, kemahiran bahasa juga berkembang apabila terdapat kemahiran mencari bukti dan meneroka sesuatu topik. Kajian terdahulu menunjukkan kepentingan menggalakkan kemahiran berfikir, terutamanya secara kritis dalam konteks L1. Perubahan positif dari segi pencapaian dan sikap subjek diperhatikan. Trend terkini dalam konteks L2 telah menunjukkan hasil yang sama. Dalam kontek Bahasa Inggeris sebagai Bahasa kedua seperti Malaysia dan negara Asia yang lain, pelajar-pelajar telah menjadi pasif dan tidak biasa dengan kemahiran berfikir yang kompleks kerana pembelajaran secara hafalan, kelas berpandukan guru dan sistem berorientasikan peperiksaan yang diamalkan dalam kebanyakan bilik darjah. Justeru, kajian ini menilai potensi strategi penyoalan *Socratic scaffolding* dalam bacaan sebagai kaedah untuk membangunkan kemahiran berfikir secara kritis pelajar-pelajar Kajian kuasi-eksperimen praujian-pascaujian ini melibatkan lima puluh lapan orang pelajar Tingkatan 4 dari sebuah sekolah menengah yang terletak di Johor, Malaysia. Pelajar-pelajar telah dibahagikan kepada kumpulan kawalan dan kumpulan rawatan dan diuji pada permulaan kajian dan di akhir sembilan pelajaran intervensi yang terdiri daripada soalan Socratic dalam aktiviti pembacaan. Ujian ANCOVA telah digunakan bagi mengukur variasi dalam kumpulan untuk skor EG dan CG serta ujian-t bebas melalui ujian-t Levene bagi mengukur Kesamaan Varians dijalankan untuk menguji perbezaan skor antara kedua-dua kumpulan. Data yang diperoleh daripada Ujian Pemikiran Kritikal Cornell Tahap X menunjukkan perkembangan kemahiran berfikir secara kritis dikalangan pelajar. Keputusan kajian menunjukkan bahawa penggunaan kemahiran berfikir secara kritis dalam aktiviti pembacaan mempunyai kesan yang signifikan secara statistik terhadap kemahiran berfikir kritis pelajar. Penemuan ini mempunyai implikasi yang berguna bukan sahaja untuk penyelidik

tetapi juga untuk pengamal dan pelajar bahasa Inggeris bahawa pemikiran kritis memainkan peranan penting dalam pengajaran pemahaman.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Arts. The members of the Supervisory Committee were as follows:

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Date:20 January 2022

Declaration by graduate student

I hereby confirm that:

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This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

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LIST OF ABBREVIATIONS

UPM	Universiti Putra Malaysia
ANCOVA	Analysis of Variance
ESL	English as a Second Language
L1	First Language
L2	Second Language
SPSS	Statistic Package for Social Sciences
CCTX	Cornell Critical Thinking Test Level X
CT	Critical Thinking
SCT	Social Constructivist Theory

CHAPTER 1

INTRODUCTION

1.1 Overview

This chapter begins with a brief concept of critical thinking (henceforth CT) and the history of the implementation of thinking skills in the Malaysian language classroom. A discussion on strategies of embedding CT in the language skills is also provided in this chapter. Next, the rationale, objectives and research questions are presented. The chapter also discusses the significance and definition of key terms related to the study.

1.2 Background of the Study

Over the past 20 years, there has been an increasing trend in studying the concept of critical thinking indicating that being critical is deemed necessary either to the 21st century students or workforce (Azman, 2016; Behar-Horenstein & Lian, 2011, Fadhlullah & Ahmad, 2017). As students of the 21st century being proficient in reading, writing and numeracy is no longer enough to excel globally (Scott, 2015). Several studies have discussed the strategies of implementing critical thinking in various disciplines and suggested for a need to alter the way students think so that they become competent to evaluate and reflect the strengths and weaknesses of any information imparted to them (Marin & Halpern, 2011).

Critical thinking has become a paramount educational goal in education not only in Malaysia, but also in other parts of the world (Azman, 2016; Yue Lin, 2014). The need to be exceptional thinkers is even elucidated in the Malaysian National Education Blueprint (2013-2025), under the Student Aspiration Section (p.10). To achieve this, the Ministry of Education (MOE) has implemented a new education system that focuses on producing students who are competitive, competent and independent. The new curriculum and assessment have integrated the higher-order thinking skills (HOTS) which aims to produce critical thinkers in all disciplines including English Language. With reference to the 1957 Education Ordinance and National Education Policy issued in 1970, English Language is institutionalized as the second language after Bahasa Melayu, the national language. Thus, English Language is a compulsory subject to be taught in both primary as well as secondary schools in Malaysia. The higher order thinking skills which include critical thinking skills are also integrated in the English language syllabus.

Malaysia officially instilled thinking skills in its curriculum in 1993 (Nagappan, 2001). The newly added component to the curriculum was part of the national agenda in gearing Malaysia to become an industrialized and united nation by the year 2020. The curriculum introduced and trained both teachers and students with the concept of creative and critical thinking. Hence, the Ministry of Education (MOE) initiated the Integrated Curriculum for Secondary Schools (KBSM) in 1993 and introduced the Critical and Creative Thinking Skills (KBKK) in 1996 which aimed to produce future generation with higher order thinking skills. The effort then continued with the use of Information and Communications Technology (ICT) as a catalyst to promote 21st century teaching and learning technologies in the process of transforming Malaysia's education system (Shaharuddin, 2009).

The effort to cultivate critical thinking skills amongst students continued with the implementation of the Standards-Based English Language Curriculum (SBELC) in 2011. In this curriculum, Higher Order Thinking skills (HOTS) and the principles of 4Cs: Critical thinking, Creative thinking, Collaboration and Communication were launched (Sulaiman, M. Ayub & Sulaiman, 2015). For instance, David Hyerle's (2012) I-Think maps were introduced in the Malaysian classrooms as one of the main visual tools to reflect students' thinking skill (Sulaiman et al., 2015). In the light of Vision 2020, the educational reforms aimed to not only achieve excellence in science and technology but also, achieve a critical thinking society.

The Malaysia Education Blueprint (2013-2025) was then released in 2013. One of the highlighted students' aspirations is to develop thinking skills. In 2013, the Primary School Standard Curriculum (KSSR) was introduced while the Secondary School Standard Curriculum (KSSM) was initiated in 2017. The main emphasis was to create students who are equipped with academic knowledge and soft skills that encompass thinking skills. There are also significant changes in the teaching of English language in secondary schools in Malaysia. The curriculum is more focused on 21st century teaching and learning styles which are more student-centered.

1.3 Statement of the Problem

The study of critical thinking in education has been explored extensively around the world such as United Kingdom (Fisher, 1999), United States of America (Bernasconi, 2010; Broadbear, 2012; Hove, 2011; Paul, 1990; Rickles, Schneider, Slusser, Williams & Zipp, 2013; Stroupe, 2006), Australia (Davies & Sinclair 2014; Golding, 2011), Israel (Zohar & Dori, 2003), Japan (Stapleton, 2001) China (Lin, 2014) and Malaysia (Fadhlullah & Ahmad, 2017; Ismail, Abdul Aziz & Husin, 2007).

Most of the studies on critical thinking in Malaysia, however, were done on university and college students (Ismail et al., 2007; Rashid & Hashim, 2008; Md Zabit, Abdul Hadi, Ismail & Zachariah, 2018; Yee, Md. Yunos, Hassan, Othman, Tee & Mohamad, 2012; Yue Lin, 2014). It is notable that very few studies on critical thinking were conducted in secondary schools in Malaysia and also in other countries (Bangert-Drowns & Bankert, 1990; Marin & Halpern, 2011). Studies in the Malaysian context indicated that secondary school students do not demonstrate satisfactory mastery of thinking skills despite the on-going efforts by the Ministry of Education to embed critical thinking in the education reforms (Fadhlullah & Ahmad, 2017). This resulted in students' inability to cope with the challenges in tertiary education (Azman, 2016; Koo, 2010; Mohd Zin, Wong & Rafik-Galea, 2014) even though critical thinking skills have been implemented in the school curriculum for more than 20 years.

One factor that contributes to this phenomenon is the classroom practices. There seems to be a discrepancy between what is widely practiced in classroom and the implementation of the thinking skill syllabus in the national agenda (Malaysian National Education Blueprint, 2013-2025). Studies reported that teacher-talk, recalling of facts and understanding of subject-matter activities dominated most classrooms in Malaysia (Azman, 2016; Musa, Koo & Azman, 2008). These classroom practices are not in tandem to what is being underpinned in the Malaysia National Education Blueprint 2013-2025 (DeWitt, Alias & Siraj, 2016; Preliminary Report of the Malaysia Education Blueprint 2013-2025) as they do not effectively foster students' critical thinking skills. The activities should incorporate self-reflection, questioning and student-centered activities. Teachers are still conformed to the traditional classroom teaching practice where the teachers' primary role is as information providers instead of as facilitators and co-learners (Fadhlullah & Ahmad, 2017).

Teachers play an important role in implementing thinking activities in the curriculum. For students to demonstrate critical thinking, teachers should be able to guide and have a solid understanding of thinking skills. It is incumbent for teachers to ensure students are engaged in their learning process. Vygotsky (1978) reiterated that 'children and adults are both active agents in children's process of development' (cited in Verenikia, 2010, p.3). According to Vygotskian theory, not only is teacher's intervention essential, but the quality of teacher-student interaction is also crucial (Tharp & Gallimore, 1988). Thus, learning is maximized when expert scaffolding or also referred as structured assistance takes place in zone of proximal development (ZPD). Scaffolding not only comes in the forms of teachers' instructions, but also through peer assistance and support from learning materials.

Examination-based curriculum practiced in Malaysian education is another factor that contributes to the lack of mastery of thinking skills in classroom (Koo, 2008; Koo, Wong & Ismail, 2012). The importance of higher order thinking skills has been enhanced with the weightage of higher order questions being raised to 50% for SPM examination while 40% for PT3 examination (Sivapakkiam, Fadzillah, Habsah, Umi & Rozita, 2016). One main area where HOTs questions are being

implemented is through reading assessment in English language classroom. Questions in Paper 2 of the English 1119 SPM examination require students to apply their thinking skills in their answers. Thus, it is necessitated that teachers infuse HOT skills in teaching reading comprehension. Unfortunately, classroom instructions using HOT skills are seldom conducted in the primary and secondary language classrooms in Malaysia. Reading is commonly taught by reading aloud or silently in the classroom and then followed by answering a set of comprehension questions either individually or as classroom discussion. Most of the questions asked are of lower order thinking skills. Consequently, Malaysian students lack the ability to think critically as they fail to explore and reflect to the texts (Md. Yunus & Mohd Arshad, 2015; Nambiar, 2007).

Despite the growing interest on the importance of critical thinking in secondary school education across all disciplines, there is a lack of studies measuring the outcomes of the thinking programs implemented by the MOE across all disciplines in Malaysian classrooms. In addition, such studies also do not employ a validated critical thinking tests such as Cornell Critical Thinking Test and Watson Glaser Critical Thinking Test. Cornel Critical Thinking Test Level X was designed to test Grade 4 to Grade 14 students' critical thinking skills. In addition, all four parts of the test correlates with the types of questions that come under Socratic questioning technique.

Studies on thinking skills conducted in the Malaysia primarily discussed the current state of the implementation of the critical thinking skills (Fadhlullah & Ahmad, 2017) or the implementation of higher order thinking skills (HOTs) in schools from the teachers' perception (DeWitt et. al, 2016; Mohamad, 2015; Suhaili, 2014; Sulaiman et al., 2017). Therefore, more studies should be conducted on secondary school students to assess the effectiveness of the implementation of higher order thinking skills.

A practical yet powerful method to be conducted in language classroom to promote critical thinking and empower students' engagement is through questioning methods (Caram & Davies, 2005). Teacher-initiated questions encourage students to explore ideas and concept as well as promote higher cognitive levels. According to Hannel (2003), highly effective questioning method improves students' engagement and create problem solvers. In order to ascertain students to practice higher order thinking skills, as well as to raise their curiosity to seek for new information and motivate them to engage with any reading texts, it is crucial that they practice asking higher order questions consistently. This is due to the fact that lower order questions which require one-word answers such as 'yes' and 'no' do not trigger higher cognitive skills.

One of the questioning methods that requires powerful technique of enquiry is Socratic questioning. Socratic questioning technique is deemed more systematic to ensure that students are consistently asking higher order questions instead of lower order questions. As Malaysian secondary school students prefer giving short responses, it is necessary that teachers introduce a more systematic and

challenging questioning strategy. Socratic questions are structured and comprises of 6 types of questions based on Paul & Binker's (1990) taxonomy.

1. Questions that probe for clarification
2. Questions that probe reason and evidence
3. Questions that probe for implications and consequences
4. Questions that probe assumptions
5. Questions about viewpoints and perspectives
6. Questions about questions.

In comparison to Bloom's Taxonomy, skills like 'recalling' and 'understanding' are of lower order cognitive skills. Questions based on recalling and understanding of a fact are not cognitively challenging as these questions merely require the students to recall a memorized fact. Socratic questioning technique stimulates students to explore a reading text deeper. For example, questions that probe reason and evidence allow students to justify their ideas or opinions. Another instance is questions of assumptions which allow students to recognize and reflect upon a hypothesis or a belief. These questioning techniques exploit critical thinking skills. Critical thinking according to Ennis (1989) is 'reasonable reflective thinking focused on deciding what to believe or do'. Therefore, by employing Socratic questioning technique, students are able to assess, reason, make assumption and consider other viewpoints of an idea or a text thoroughly. Critical thinking skills and Socratic questions share similar objectives.

Thus, this study aims to explore how scaffolding Socratic questioning technique influences students' CT skills in the secondary, English language classrooms. The researcher seeks to investigate the effects of Socratic questioning in facilitating students' reading comprehension. As students are new to this technique, the Socratic Bookmark was utilized as a scaffolding tool. The study also focuses on a set of guidelines in creating critical thinking lesson plans which are based on works of thinking experts (Facione, 1990; Fisher, 2000; Halpern, 2003; Marzano, Pickering & Mc Tighe, 1993; Paul & Binker, 1990; Swartz, Costa, Beyer, Reagan & Kallick, 2008; Swartz, 2008) that promote explicit teaching of critical thinking skills.

1.4 Objectives of the Research

This study aimed to analyze students' critical thinking skills using scaffolding Socratic questioning technique in reading classrooms. The specific objectives of this study were to:

a) identify the current level of students' critical thinking skills.
b) determine the effect of employing scaffolding Socratic questioning strategy on the development of students' critical thinking skills.

1.5 Research Questions

Based on these objectives, this study aimed to investigate the following research questions.

1. What is the level of critical thinking skills of students?
2. To what extent does scaffolding Socratic questioning strategy affect students' critical thinking skills?
3. Which part of the Cornel Critical Thinking Test Level X is proficiently acquired by the students?

1.6 Conceptual Framework

This section presents the conceptual framework of this research. Figure 1.1 illustrates how Socratic questioning strategy is being scaffold in the intervention. The conceptual framework provided a holistic view of how L2 learners developed their critical thinking skills.

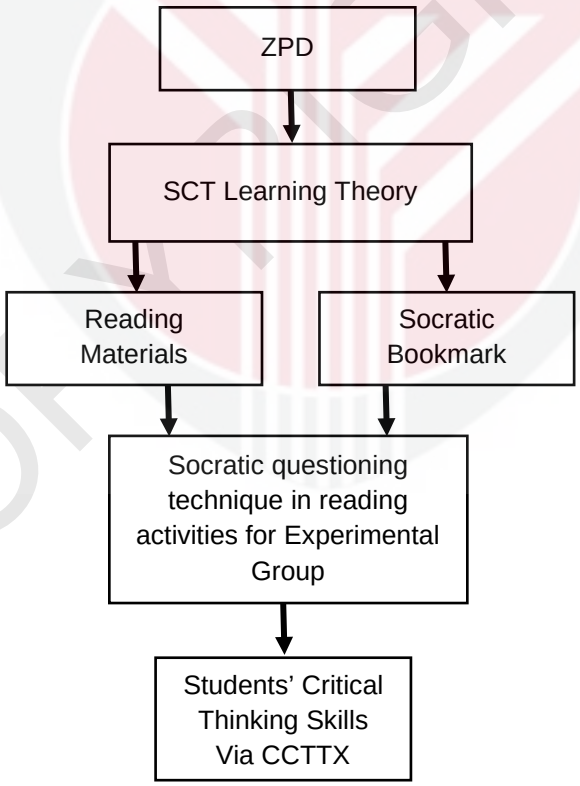

Figure 1.1: Conceptual Framework

The primary assumption of this study is that through consistent and effective questioning skills could develop critical thinkers. Thus, Socratic questioning strategy is a more systematic and structured questioning technique to assist students' in asking more questions and to probe deeper on the matter discussed. Students lacked critical thinking skills as they were not exposed to activities such as group work or project-based activities that required them to be critical thinkers. Teacher-centered activities dominated most of the language classrooms in secondary schools. Thus, the use of Socratic questioning technique in reading activities scaffold students to be critical and not only be passive recipients of a text. By implementing Socratic questions while reading a text, students were able to slow down their thinking and did not merely skim through the text. According to Paul & Binker (1990), by asking Socratic questions students are able to organize their ideas coherently in a more specific perspective. Thus, the Socratic Bookmark as well as group and pair activities were means to assist secondary school students in developing their critical thinking skills following the principles of Social Constructivist Theory.

1.7 Significance of the Research

This research is significant as it aims to fill a gap in literature by proposing a method to develop students' critical thinking skills by focusing on the four sections tested in the Cornell Critical Thinking Test Level X: induction, deduction, observations and credibility and assumption identification. It is noteworthy to mention that not many studies on critical thinking are conducted in Asian L2 context (Lin, 2014) as well as Malaysia. Past studies indicated that the teaching of critical thinking is not encouraged in Asia due to cultures as well as limited language proficiency in English (Atkinson, 1997). Thus, the findings from this study will add to the field of knowledge on how students can be taught and benefit from the intervention. In addition, the study also highlights the explicit instruction in teaching critical thinking skills in tandem with various works of thinking experts (Facione, 1990; Fisher, 1999, 2000; Halpern, 2003; Marzano, 1993; Paul and Binker, 1990; Swartz, Costa, Beyer, Reagan & Kallick, 2008; Swartz, 2008).

Equally important, the study also discusses the socio-cultural theory of Vygotsky in particular, the concept of ZPD that underpins the approach of this study and how it is viable to be used in the 21st century. The ICT and other educational tools in view of Vygotsky's theory were related with the 21st century students' real-life activities and the utilization of these tools can improve students' performance (McGuinness, 1999; Verenikina, 2010). Mental processes can be understood if teachers understand the tools and signs that mediate them (Vygotsky, 1978)

Effective questioning can lead a student to solve a problem by initiating a solution or giving ideas (Beyer, 2008; Ennis, 2001; Marzano, 1993; Vygotsky, 1978). The primary focus of employing Socratic questioning technique was to encourage students to probe deeper into the topic discussed and venture into other

perspectives (Paul, 1990; Zohar & Dori, 2003). By internalizing Socratic questioning technique, students can practise reflecting, self-evaluating and self-correcting which in turn can sharpen their critical thinking skills.

To sum, this study enriches the existing empirical research on the development of critical thinking in the teaching of reading in English language in Malaysian secondary schools. It could aid future research, educators and policy makers especially in designing a language program that incorporates thinking as its primary component. Educators and policy makers must also focus on the quality of teacher-student interaction and come up with new programs which ensures that teachers fully understand the fundamental principles of critical thinking (Fisher, 1999; Verenikina, 2010; Vygotsky, 1978). In order to teach students to become better thinkers.

1.8 Definition of Terms

Scaffolding

Scaffolding is a tool to assist students in mastering a skill. It can be in a form of guidance from peers and teachers or any kinds or learning tools like cards, books or even digitized applications. Without such scaffolding, it will not be possible for the students to learn such skills.

Socratic Questioning

Socratic questioning is a systematic questioning strategy utilized as the intervention of this study. The basis of this strategy is that all kinds of thinking have a logic or basic structures (Paul & Binker, 1990). The Socratic Bookmark (Appendix A) guided students in asking questions. Students refer to the bookmark and independently pose these questions as they explore a reading text. This bookmark acts as a mediating tool to enhance the use of Socratic questions

Critical Thinking Skills

Critical thinking skills in this study are based on the skills tested in the Cornell Critical Thinking Test Level X which assesses induction, deduction, observations and credibility and assumption identification. CCTTX was used in the pretest as well as the posttest. Induction and deduction are vital skills in assessing an argument. Induction is when one observes specific information and then, makes a broad generalization based on it while deduction is the opposite of induction. It establishes a deductive argument. The third skill, observations and credibility assess the objective and subjective components of source reliability. On the other hand, identification of assumptions allows one to draw causal inference either to identify reasoning or the conclusion of an argument. These skills are in tandem

with the definition posited by Ennis, (1989) ‘reasonable reflective thinking focused on deciding what to believe or do'.

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