DEVELOPING LEARNERS' EMPLOYABILITY SKILL OF CRITICAL THINKING THROUGH COLLABORATIVE ONLINE DISCUSSION AT TERTIARY INSTITUTION

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ABSTRACT

Various studies reported that Malaysian students at tertiary institutions were lack of certain employability skills namely critical thinking. Lack of critical thinking skills is identified when the students are unable to perform tasks, especially those of problem solving. Consequently, the students who lacked this skill were unemployed upon their graduation. A drastic approach to overcome this issue must be addressed. Instead of blaming unemployed graduates, the tertiary institutions with e-learning technology were urged to play a significant role. Through online forum discussions, the students were taught to use Socratic questions (Paul, 1993) as this would help them to develop critical thinking skill when they look deeper into the viewpoints, perspectives and evidence in analysing the assumptions (Walker, 2005). This study adopts a mixed-method case study approach. The quantitative data derived from Watkins and Corry's (2005) questionaires measures the students' e-learning readiness and their usage of online forum discussions. The qualitative data derived from the transcripts of the students' online discussions explains how the students develop their critical thinking using Socratic questions. The transcripts were analysed in two stages using (1), the Socratic Question Prompts and (2), a content analysis approach of the Interaction Analysis Model by Gunawardena et. al. (1997). The findings indicated that students' critical thinking skills could be developed from collaborative learning through online forums. The outcome could be used to propose the best practice for lecturers at higher learning institutions to promote students to think critically through collaborative online discussion.

Keywords: *Critical Thinking, Employability Skills, Online Discussions, Socratic Questioning Prompt, Interaction Analysis Model (IAM)*

1. INTRODUCTION

Since 2001, a report from the Third Outline Perspective Plan has been targeting for Malaysia to become a knowledge-based economy and a developed nation by 2020. As knowledge-based economy, Malaysia requires highly educated workers and thus, strategic thrust areas are continuously being planned by the National Information Technology Council (NITC). From the aspect of educated workforce, Malaysia is hoping to enrol more than 40 per cent of the school leavers at higher learning institutions by 2020. Thus, more colleges and universities are needed to cater the growing student population in Malaysia.

However, the present scenario is that obtaining a college or university degree alone is not sufficient to guarantee employment. Over the years, there have been various reports on unemployment problems among Malaysia graduates.

Various studies reported that Malaysian students at tertiary institutions were lack of certain employability skills.

A study conducted by Rohani et al. [36] indicated that students at public universities lacked critical thinking and their level of thinking was moderately low. In 2009, the Ministry of Higher Education used an instrument called the Malaysia soft skills scale (My3S) to gauge the employability skills proficiency of 10,828 final year and 39,465 first year university students. Unfortunately, the scale's findings revealed that the students were weak in two important skills - communication and critical thinking [34]. Roselina [37] points to the lack of employability skills as being the cause of Malaysian graduates unemployment, not because they were not intelligent. Fairuzza Hairi et al. [14] conducted a study on graduate unemployment and emphasised the importance of employability skills that must be acquired by the students. A study by Abdul Malek

Abdul Karem et. al. [1] showed that unemployment among graduates was due to lack of employability skills. Nik Hairi Omar, et al. [28] reported that many graduates who lacked employability skills were unemployed. The Malaysia Economy in Brief 2013 Report indicated an increase of 0.1% in the unemployment rate in 2013 as compared with 2012 where the number rose from 386,000 in 2012 to 426,000 in 2013 [11]. In 2016 alone, the Malaysian Employers Federation (MEF) reported that there were 200,000 unemployed graduates in Malaysia [39]. Based on those statistics, Malaysian employers would generally have the tendency to blame the graduates for lack of employability skills [12].

However, instead of blaming graduates for lacking employability skills, some studies indicated that tertiary institutions were not producing "work-ready" graduates; the institutions are producing graduates with only theoretical competence as the nation's education system is too exam-oriented [46]. In response to the problem, Jamal Ali [18] recommends that various steps should be taken by tertiary learning institutions to ensure that their graduates are well equipped with the right soft skills demanded by the various industrial sectors. Nurkaliza Khalid et al. [30] named critical thinking skill as one of the important soft skill highly required by the industries. Lack of critical thinking skill can be identified by the graduate's inability to perform tasks, especially problem solving, and as a result, employers are not keen to hire them.

However, the strategy to tackle the problem of unemployment is not to wait until the students graduate from the institutions and then provide them with training courses. Instead, the learning institutions should take the pro-active approach of preparing the students with employability skills while they are still studying / learning.

The Malaysian government recognised the need to urgently address the issue of unemployment, and, through the Ministry of Higher Education, a module that outlined several components of employability skills, including critical thinking, was developed [25]. The module suggests that it was the responsibility of the universities to ensure students graduate with the relevant employability skills in order to gain employment. However, according to Arned [2], learning institutions could not expect students to simply acquire critical thinking skill on their own; it requires the teacher or lecturer to play the role of guiding them on how to develop critical thinking.

In 2012, The Higher Education Ministry launched the Graduate Employability Blueprint 2012-2017 to address the issue. The aim is to achieve a minimum of 75 percent of graduates to join the workforce upon completing their studies.

2. RESEARCH BACKGROUND

From the literature, there are various advantages of using the asynchronous online forum. Through students' online discussions, the forum could be used as a potential method to encourage thinking [24]; the instructor could guide students to develop deeper and reflective learning as they could argue and exchange ideas [23]; and it could enable more reflective and spontaneous discussions [16]. Online forum provide opportunity to develop interaction and collaboration among learners and thus, creating a learning community [4]. According to Williams and Humphrey [44], an online threaded discussion could only be considered interactive when learners within that online community continuing to respond to each other. Cranney et al. [9] explain that the number of students' online postings does not necessarily reflect the productive discussions, but the quality of the discussions through the postings.

Blanchette [3] discovered that asynchronous discussions could lead to students achieving a higher level of cognitive questions that encourage critical thinking, provided that their cognitive level of response matches the cognitive level of the questions asked. Higher level cognitive questions could also promote the ability to interpret, analyse, evaluate, infer, explain and self-regulate. However, for Walker (2005), it was not sufficient to use the asynchronous online forum alone, but an effective use of questioning strategies was needed that could guide the students' discussions and eventually promote critical interaction. Littleton and Whitelock [22] emphasise the technique of using questions to invite students to contribute to the discussions could elicit knowledge. Bradley et al. [5] found that the type of question posed by the instructor would determine the degree of answer completion and the students' high-order thinking in their discussions. In relation to this, Paul [33] suggests the use of the Socratic questioning prompt, one of the popular techniques that can guide and encourage students to develop thoughtful questions.

Using Socratic Questioning Prompts

Besides instructor, the students must also know how to pose questions. In order to avoid any

confusions and ambiguities, students must engage in discussions with clarity by asking the proper questions. According to Yang et. al. [45], asking the right questions plays an important role in achieving higher cognitive level (such as self-reflection, revision, social negotiation, and conceptual change) that contributes to students' critical thinking. The students' level of thinking is commonly influenced by the types of questions posed to them [20].

Socratic question focuses on the use of logical consistency and clarification. According to Paul [33], Socratic questions help students to think in many directions and with various purposes including the exploration of complex ideas, knowing the truth, opening up issues and problems, uncovering assumptions, analysing concepts, distinguishing what we know and what we do not know and following the logical implications of thought. In addition, Socratic questions encourage critical thinking when students look deeper into the assumptions, viewpoints, perspectives and evidence in analysing the assumptions [40]. This Socratic approach could stimulate the students' minds to continuously pose questions [33]. There are six important questions outlined by the Socratic Questioning Prompt - questions of clarification, questions that probe assumptions, questions that probe reasons and evidence, questions that probe implications and consequences, questions about viewpoints or perspectives, and questions about questions. However, in this study, the type of questions about questions is further divided into two - questions about the initial question or issue and questions that probe origin or source questions (see Table 1). Socratic questions encourage students to strategise their questions in order to build critical thinking. Socratic question is a question of depth [33] and is suitable for students to develop critical thinking. Each question based on Socratic Questioning prompt is further elaborated in table 1.

Table 1: Examples of the type of questions that based on the Socratic questioning prompt [33]

1.   Questions of Clarification
• What do you mean by _____?
• What is your main point?
• How does_____ relate to_____?
• Could you put it another way?
• What do you think is the main issue here?
• Let me see if I understand you: do you mean _____ or _____?
• Jane, could you summarize in your own words what Richard has said?
• Richard, is that what you meant?
• Could you give me an example?
• Would this be an example:_____?
• Could you explain that further?
2.   Questions about the Initial Question or Issue
• How can we find out?
• What does this question assume?
• Would _____ put the questions differently?
• Can we break this question down at all?
• Does this question lead to other questions or issues?
3.   Questions that Probe Assumptions
• What are you assuming?
• What could we assume instead?
• You seem to be assuming _____. Do I understand you correctly?
• How would you justify taking this for granted?
• Is this always the case? Why do you think the assumption holds here?
4.   Questions that Probe Reasons and Evidence
• What would be an example?
• Could you explain your reason to us?
• Are those reason adequate?
• Do you have any evidence for that?
• How could we find out if that is true?
5.   Questions that Probe Origin or Source Questions
• Where did you get this idea?
• Have you been influenced by media?
• What caused you to feel this way?
6.   Questions that Probe Implications and Consequences
• What are you implying by that
• What effect would that have?
• What is an alternative?
• If this is the case, then what else must be true?
7.   Questions about Viewpoints or Perspectives
• How would other groups of people respond? Why?
• How could you answer the objection that_____ would make?
• What would someone who disagrees say?

3. THE RESEARCH QUESTIONS

Mastering critical thinking has been introduced by the Ministry of Higher Education Malaysia since 2006 as one of the seven employability skills that students at Malaysian public universities must acquire while the Graduate Employability Blueprint 2012-2017 outlines the target to get them employed upon graduation. By referring to the employability module and the Graduate Employability Blueprint, it was important for teachers to conduct an effective teaching method that could foster critical thinking skills among undergraduate students.

Based on *the use of asynchronous online forum discussion* and *the application of Socratic questions prompt*, this study looked at how critical thinking skills could be developed through the use of collaborative asynchronous online forum discussions. The research questions proposed are as follow:

1. What was the students' readiness and usage level of using online forum in their learning process?
2. What was the students' usage of discussion in using online forum?
3. How could critical thinking skill be developed through collaborative online forum discussion in the students' learning process?

4. CONCEPTUAL FRAMEWORK

The conceptual framework of this study is developed based on the literature of the instructional technology of online group work (figure 1).
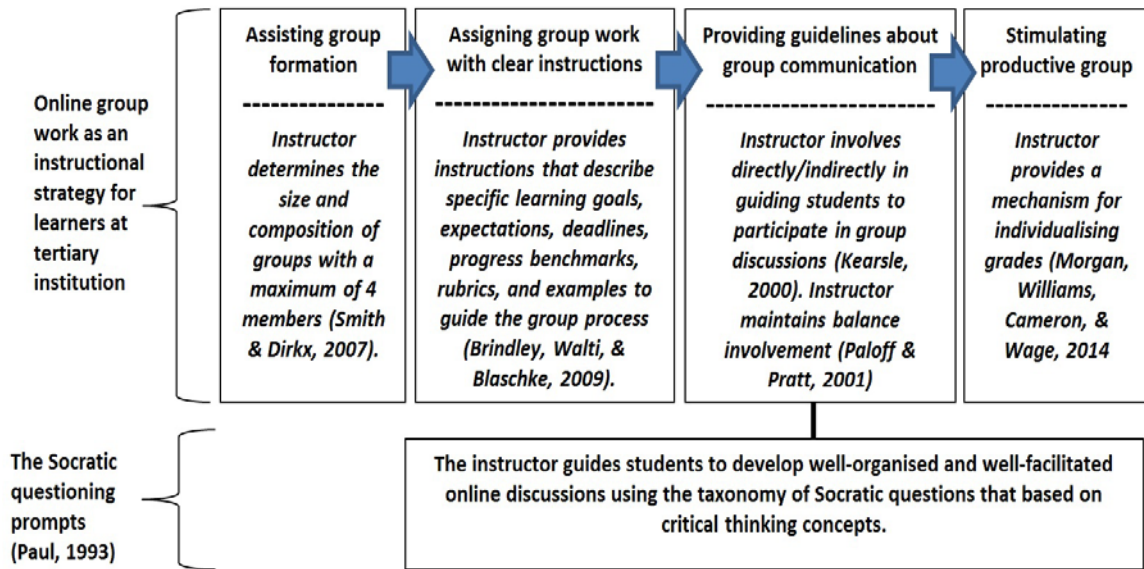

Figure 1: Using online group work and the Socratic question prompt (Paul, 1990) as a conceptual framework in this study.

The framework divides this study into four significant stages of the role of instructor in guiding the students to participate in online discussions. First and foremost, the instructor should assist the group formation especially on the size and composition of groups. Smith and Dirkx [38] recommend a maximum of only four members working in a small group as this would encourage easy interaction and open ideas exchange.

Depending on the instructional goals of the assignment, the instructor can decide either to form a heterogeneous or homogeneous grouping of students. Next, the instructor should provide clear instructions on how to complete the group assignment. According to Brindley et. al. [6], these instructions must describe all the details about the course that could guide the group process. The next important step is the involvement of the instructor

in students' online discussions. Kearsley [19] emphasises the constant presence of the instructor in the online forum as he must actively participate in the discussions. However, the instructor must be able to determine how much he should respond to the students' interactions. He needs to maintain a balance between involving too little and too much in the students' online discussions [31]. During this guidance, the instructor introduces the strategy of using Socratic questions. The significant aim of the Socratic questioning method is to engage students in collaborative discussion where they have to use the right questions to derive multiple answers and to obtain deeper understanding [33]. The Socratic questions guide the students to ask the kind of thought-provoking questions that develop deep explanations and build critical thinking skills. The sequencing of the higher-order Socratic questions also helps to support student learning through discussions by eliciting deeper understanding of topics. The final step is to constantly encourage students to get engaged in online discussions. Morgan, et. al. [27] suggest that the instructor should provide a mechanism such as assessments on group process on every individual member of each group. The assessment could include peer evaluations where each member has the opportunity to provide anonymous feedback on other members in the group.

5.   METHODOLOGY

The design of this study is a case study. According to Feagin et al. [15], a case study is an ideal research methodology that involves a holistic and in-depth investigation. Based on Creswell's [10] mixed-method approach, the study would gather both quantitative and qualitative data. A purposive sampling of 41 student respondents of first year who enrolled in the subject of Telecommunications and Networking was selected.

6.   RESEARCH PROCEDURE

The research procedure in this study follows the four progressive steps as outlined in details by the research framework (figure 1).

At the start of the semester, the instructor met the students in class. The instructor divided the students into small groups. They were told to work as a team to accomplish group tasks given by the instructor. Each group was allocated with online forums through the university e-learning platform. They

were required to discuss through these online forums. In order to develop productive discussions, the students were taught how to use the strategies/techniques of Socratic questions (Socratic Questioning Prompts) compiled by Richard Paul [32], with seven types of "trigger" questions as a guide to develop critical thinking skill in their discussions (see table 1).

Online group work is used as an instructional strategy in this study where it requires both the teacher/instructor and the students to be already familiar with and good at elearning. The teacher/instructor involved has been using the elearning in his teaching for more than 10 years.

7.   DATA GATHERING

The data gathering part is divided into two main phases.

Phase I: The students' levels of readiness and usage of discussion in using online forum

For a quantitative method, questionnaires were used to collect data. The questionnaire was adapted from Watkins and Corry [41] with some modification to suit the study. In validating the questionnaire, the following procedure was conducted. The questionnaires were referred to experts in the field of e-learning to get their feedback on the items for further improvement or amendments, if any. The questionnaires were then tested using the Statistical Package for Social Software Science (SPSS) to obtain the value of alpha (reliability coefficient) to determine the validity of the questions (items reliability). The questionnaires contained items related to two main sections: (A) the readiness of the respondents in the use of online forums, and (B), views/opinions/experience of the respondents engaging in discussions through online forums in the teaching and learning process. The questionnaires required respondents to choose a tendency according to the Likert scale. After receiving feedback from the questionnaires, the collected data were systematically checked and analysed, by using the SPSS, through descriptive statistical methods. The findings were used to address the first and second research question.

Phase 2: The collaborative online forum discussion in students' learning process

The instrument used to gather data for the qualitative method was the online forum. In this study, the students' discussions through online forum were analysed using the strategies / techniques of the Socratic question. The data were referred and analysed once again using the interaction analysis model (IAM) [17] as recommended by Yang et al., [45]. IAM has five phases as shown in Table 2. The transcripts of the students' discussions through online forums were printed and analysed by two raters – the course instructor or teacher and the researcher. Both the teachers and researcher who have over ten years experiences teaching multimedia courses using online forums were selected to code the discussion content independently.

A coding procedure was developed based on the combination between the Socratic Questioning Prompt [32] and IAM.

Table 2: The interaction analysis model (IAM) [17]

Phase I : Sharing/comparing of information
A. A statement of observation or opinion
B. A statement of agreement from one or more participants
C. Corroborating examples provided by one or more participants
D. Asking and answering questions to clarify details of statements
E. Definition, description, or identification of a problem
Phase II: The discovery and exploration of dissonance or inconsistency among ideas, concepts, or statements
A. Identifying and stating areas of disagreement
B. Asking and answering questions to clarify the source and extent of disagreement
C. Restating the participant's position, and possibly advancing arguments or consideration in its support by references to the participant's experience, literature, formal data collected, or proposal of relevant metaphor or analogy to illustrate point of view
Phase III: Negotiation of meaning/co-construction of knowledge
A. Negotiation or clarification of the meaning of terms
B. Negotiation of the relative weight to be assigned to types of argument
C. Identification of areas of agreement or overlap among conflicting concepts
D. Proposal and negotiation of new statements embodying compromise, co-construction
E. Proposal of integrating or accommodating metaphors or analogies
Phase IV: Testing and modification of proposed synthesis or co-construction)

A. Testing the proposed synthesis against "received fact" as shared by the participants and/or their culture
B. Testing against existing cognitive schema
C. Testing against personal experience
D. Testing against formal data collected
E. Testing against contradictory testimony in the literature
Phase V: Agreement statements/applications of newly constructed meaning
A. Summarisation of agreement
B. Applications of new knowledge
C. Metacognitive statements by the participants illustrating their understanding that their knowledge or ways of thinking (cognitive schema) have changed as a result of the conference interaction

After analysing the transcripts of the online discussions in two stages based on the seven types of Socratic question and IAM model, the analyses from both raters were compared and contrasted. The formula states that the total numbers of agreements from the two raters is divided by the overall total numbers of both agreements and disagreements. The comparison of the results showed that the percentage of agreement between the two coders was 91.1%.

8. FINDINGS AND DISCUSSIONS

This section discusses the data analysis gathered from questionnaires and the transcripts of the students' online discussions. For quantitative data analysis, the data from the questionnaires were analysed using SPSS while the transcripts of the online discussions were analysed qualitatively based on coding schemes derived from Socratic questioning prompt [32] and IAM [17].

5.1. Quantitative Analysis

The data analysed through the qualitative approach discussed the students' readiness and usage level of using online forum in their learning process, as well as the students' usage of discussion in using online forum.

The Student Readiness in Using E-Learning

Overall, it was found that the level of students' readiness in using online forums was high. This showed that students were prepared to use online forums in e-learning. As the students were already adept at using file attachment in email delivery, they were also adept at using the same method through an online forum which allows them to

upload or download assignments to their teachers. In a study by Card and Horton [7], the findings indicated that students enjoyed the convenience of how a course is conducted through e-learning. E-learning also provides students with flexibility in their learning process [13]. Therefore, students did not have to come to the classroom to submit their assignments as they could be sent from their homes at any time simply by using the Internet. Students did not feel that learning through computer was a difficult task as they were well-versed in handling "saving" files, creating folders and so on. In addition, students could communicate effectively with others by using online technologies such as e-mail and chat. Through the forum, e-mail and chat on e-learning can be a medium between students and lecturers to communicate with each other. According to Mohamed Amin Embi [26], e-learning can support the teaching and learning process, and it is very important as a medium of communication between students and teachers. The use of online forums also helps improve academic achievement. It provides an opportunity for students to find and share information with other students and teachers. The Internet is one of the sources for students to find learning materials as well, besides getting it from school [21]. According to Wheeler et al. [42], anyone can access learning materials in any way with an internet connection. This has addressed the first research question.

The Use of Online Discussion Forum

On the whole, the findings revealed that the use of an online forum for discussions was high. This showed that the online forum is not just a place to interact with other students but is a tool to assist in their learning process. The use of online discussion forums allows students to refer back to the previous topic so that they could still follow the discussions, be reminded of the content, or search for further information on the course. Students were able to follow a line of communication (online) by typing the keyboard (writing). In fact, communication technology through an online discussion forum requires students to use the spoken language as in writing. Online discussion also indirectly improved students' writing when they posed opinions in the discussion forum (Graham et al., 2001). This has addressed the second research question.

Thus, quantitative data derived from the positive findings revealed that the student respondents (sampling) are well-versed with elearning especially using online forum for discussions. It is vital that the student respondents are adept at elearning so that they know how to manage the online discussions with the teacher's/instructor's guidance. With the reliable findings from quantitative approach, the analysis is continued with qualitative approach.

5.2. Qualitative Analysis

This section discusses the findings on how critical thinking skills can be developed through collaborative online forum discussion. The method used in this study was content analysis. The online discussions from the e-learning forum derived from each group provided the qualitative data. These qualitative data were analysed twice using a coding system developed by the researchers, based on Socratic questioning prompts [33] and IAM [17].

Coding for Socratic Questioning Prompts

Each question in Socratic questioning prompts is represented by a specific abbreviation or code (Table 3).

Table 3: Coding scheme for strategy / technique Socratic question

Questions	Code
1. Questions for clarification	QC
2. Questions about the initial questions or issue	QIQ/I
3. Questions that probe assumption	QPA
4. Questions that probe reasons and evidence	QPRE
5. Questions that probe origin or source questions	QPO/S
6. Questions that probe implications and consequences	QPIC
7. Questions about viewpoints or perspectives	QV/P

Data Analysis using Socratic Questioning Prompts coding

The following table (table 4) shows the analysis of the online discussions using Socratic Questioning Prompts coding.

Table 4: The numbers of postings (online discussions) categorised based on the Socratic Questioning Prompts coding

Questions / Group	QC (Clarify)	QIQ/I (Initial Question/ Issue)	QPA (Probe for Assumption)	QPRE (Probe for Reasons & Evidence)	QPO/SQ (Probe for Origin/ Source Question)	QPIC (Probe for Implication & Consequences)	QV/P (Viewpoints/ Perspective)	Total
1	2	5	0	0	0	1	0	8
2	2	1	0	0	0	0	0	3
3	5	3	3	1	0	0	2	14
4	3	0	0	0	0	0	2	5
5	1	0	1	0	0	1	1	4
6	3	2	1	0	0	0	0	6
7	2	4	5	0	0	2	1	14
8	4	2	3	0	0	3	4	16
9	1	2	1	0	0	0	1	5
10	1	2	0	0	0	0	1	4
11	5	2	3	0	0	0	1	11
Total	29	23	17	1	0	7	13	∑ = 90

Based on Table 4, the type of questions posed by the students when discussing online with their group members were mostly questions for clarification (QC) with a total of 29 questions asked. This was followed by 23 postings related to the initial question or issue (QIQ/I), 17 postings related to questions that probed assumptions (QPA), 13 questions about viewpoints or perspectives (QV/P) and seven postings related to the questions probing implications and consequences (QPIC). The lowest was a single posting related to questions that probed reasons and evidence (QPRE). There were no postings related to the questions that probed the origin or source questions (QPO/S).

From Table 4, the groups that had more than 10 postings identified, using the Socratic question technique in their online discussions, were group 8 (16 questions), group 3 (14 questions), group 7 (14 questions) and group 11 (11 questions). Group 1 and 6 had eight and six postings respectively. The remaining groups with postings identified using this technique were group 4 (five questions), group 9 (five questions), group 5 (four questions), group 10 (four questions) and group 2 (three questions). After the data had been analysed using the Socratic question technique, the next stage was to conduct a more extensive analysis using the second coding, which was based on the IAM [17].

Socratic Questioning Prompts & IAM coding

Each phase in the IAM [17] is represented by a code. For example, IA represents Phase I of a statement of observation or opinion, IB represents Phase I of a statement of an agreement from one or more other participants and IIA represents Phase 2 of identifying and stating areas of disagreement. Other phases in the IAM were coded in the same manner.

Next, the coding developed from the Socratic Question Prompts (see Table 5) was then combined with the coding developed from the IAM (Gunawardena, et al., 1997) to conduct further analysis. For example, group 1 had asked two questions to seek clarification on the question (QC). The first question is categorised under Phase I of a statement of observation or opinion and thus is coded as QC-IA. The second question is related to the statement C (corroborating examples provided by one or more participants) in Phase I of the IAM, and is coded as QC-IC. The same encoding process applies to all questions from all groups. Table 5 shows the code developed for the analysis of the online discussion forums based on a combination of Socratic questioning prompts and IAM.

Table 5: The Analysis of Online Discussion Forums based on the combination of Socratic questioning prompts [32] and IAM [17]

Phase / Group	IAM	I-A	I-B	I-C	I-D	I-E	II-A	II-B	II-C	III-A	III-B	III-C	III-D	III-E	IV-A	IV-B	IV-C	IV-D	IV-E	V-A	V-B	V-C
1		QC		QC	QIQ/I	QPIC				QIQ/I QIQ/I QIQ/I QIQ/I												
2	S O C R A T I C					QC				QC QIQ/I												
3		QIQ/I QPA QC	QV/P		QC QIQ/I	QPRE QIQ/I			QC	QC QC	QPA	QPA								QV/P		
4	Q U E S T I O N I N G			QV/P	QC	QC QC				QV/P												
5		QC								QPIC QV/P					QPA							
6				QC	QIQ/I	QC				QIQ/P QC							QPA					
7	P R O M P T S	QPA			QIQ/I QIQ/I QC QPA QPA			QC		QPA QIQ/I	QIQ/I	QPIC QV/P			QPA QPIC							
8		QV/P	QC QC	QIQ/I QIQ/I	QV/P QPA QPA QPIC			QPA		QPIC QPIC		QC								QC QV/P QV/P		
9								QPA		QC QIQ/I					QIQ/I					QV/P		
10			QC		QV/P					QIQ/I QIQ/I												
11		QPA			QC QC QV/P			QPA		QC QC QC QIQ/I					QIQ/I		QPA					

A summary of the analysis for each group based on a combination of Socratic questioning prompts and IAM is shown in Table 6.

Table 6: A summary of analysis based on a combination of Socratic questioning prompts and IAM

Group	A combination of Socratic question prompts and IAM coding
1	QC-IC, QCI-IA, QIQ/I-IIIA, QIQ/I-IIIA, QIQ/I-IIIA, QIQ/I-IIIA, QPIC-IE
2	QC-IIIA, QC-IE, QIQ/I-IIIA
3	QC-ID, QC-IIC, QC-IA, QC-IIIA, QC-IIIA, QIQ/I-IA, QIQ/I-ID, QIQ/I-IE, QPA-IA, QPA-IA, QPRE-IE, QV/P-VA, QV/P-IB
4	QC-IE, QC-ID, QC-IE, QV/P-IIIA, QV/P-IC
5	QC-IA, QPA-IVA, QPIC-IIIA, QV/P-IIIA
6	QC-IIIA,QC-IC, QC-IE, QIQ/I-IIIA, QIQ/I-ID, QPA-IVC
7	QC-IIB, QC-ID, QIQ/I-ID, QIQ/I-ID, QIQ/I-IIIA, QIQ/I-IIIB, QPA-IIIA, QPA-IVC, QPA-ID, QPA-ID, QPA-IA, QPIC-IIIC, QPIC-IVC, QV/P-IIIC
8	QC-VA, QC-IIIC, QC-IB, QC-IB, QIQ/I-IC, QIQ/I-IC, QPA-IIB, QPA-ID, QPA-ID, QPIC-IIIA, QPIC-ID, QPIC-IIIA, QV/P-ID, QV/P-IA, QV/P-VA, QV/P-VA
9	QC-IIIA, QIQ/I-IVA, QIQ/I IIA, QPA-IIB, QV/P-VA
10	QC-IB, QIQ/I-IIIA, QIQ/I-IIIA, QV/P-
11	QC-ID, QC-IIIA, QC-IIIA, QC-IIIA, QC-ID, QIQ/I-IVA, QIQ/I-IIIA, QPA-IA, QPA-IIB, QPA-IVC, QV/P-ID

The findings of the study revealed that students developed their critical thinking through collaborative online discussions using Socratic questioning techniques. Collaborative learning is one way to encourage critical thinking as it allows the active exchange of ideas within small groups; it not only increases interest among the participants but also promotes critical thinking. However, it must be done through proper strategies and guidance by the instructor. Proper strategy not only improves the quality of online discussion, but guides the asynchronous discussion, as well as encouraging critical interaction [40]. According to MacKnight [23], collaborative online discussion provides guidance so that each student can bring ideas, intellectual nature and reflective learning deeper to the next level.

As critical thinking involves a high cognitive level, it could promote critical dialogue and thus develop critical thinking. The strategy of Socratic questioning is that it encourages students to use a higher cognitive or affective level in the process of critical thinking [40]. The technique of Socratic questions mostly used by students was the question for clarification. By submitting questions for clarification, they were not only getting information but clarifying doubts on a topic. With the

involvement of the instructor in clarifying any doubts, the use of questions always led to continuation of discussion threads [8]. Although interaction begins with the instructor's question, he did not involve too much in the students' discussions [19]. The next type of posting after question for clarification was questions about the initial question or issue. These questions were related to a presenting problem or issue and the Socratic questions guided the students' thinking. As for questions that probe assumption, many students took the easy way in asking questions based on the assumption of their thoughts and, mostly without proof. The process usually occurred at the level of their subconscious or unconscious thoughts. At this point, the students ensured that their assumptions were clear and accompanied with reasonable and strong evidence. The next type of question most posted by the students was questions about viewpoints or perspectives. Many students gave their personal views after discussing a topic, which is important as each member had different thoughts and opinions. Besides communicating through online forum, the e-learning technology also has the feature of synchronous learning that audio and video streaming [35]. This would complement the asynchronous online discussions. The advantage of synchronous interaction does not only appeal to distance learners, it is also benefits online and blended learning as well [29].

After analysing online postings based on the Socratic questioning prompts, the second stage analysis continued using the IAM [16]. The results showed that the students' online discussions through online forums were focused on the occurrence of knowledge construction. According to Gunawardena et al. [16], the movement from one phase to another, within five phases of knowledge construction, indicated that the knowledge was constructed through the social negotiation process. This has addressed the third research question.

Using online group work (conceptual framework) as the instructional strategy, the instructor had structured the use of online forum through purposeful design that provided guidelines for students' interaction that generates meaningful discourse. Through elearning forum, the students have sufficient time to reflect and compose their in-depth thoughts before participating in the online discussion. Based on the Socratic questioning prompts, the students were taught to use the lower to higher order questioning techniques and activities in order to synthesise key concepts of their

discussions and eventually promoting and encouraging critical thinking skills.

9. LIMITATIONS

Creating effective online discussions requires knowledge, time, experience, talent, commitment, and constant communication with the students. The instructor also needs to be always available online. However, no matter how carefully the instructor designs the use of online discussions based on the conceptual framework suggested in this study; there is no guarantee that the students would smoothly follow the instructions and easily understand the Socratic questioning prompt. Thus, the instructor has huge responsibilities to ensure that every student respondents involved would not easily become disengaging.

To do this, the instructor plays an important role. Besides guiding the students to start developing questions at the lower level of thinking skills and gradually building to a higher level based on the Socratic questioning prompt, it is suggested that the instructor should also introduce the use of Bloom's taxonomy. The taxonomy could be a starting point for the students to design an appropriate level of question and use it as a guide to develop Socratic questions. This would prompt students to express their different ideas and opinions while constantly receiving consistent feedback from instructor

10. CONCLUSION

The study found that students' critical thinking skills can be built from collaborative learning through online forums. Developing students' critical thinking skill through online discussions is not impossible as long as the students were mentored and provided with guidance. The instructor plays an important role in providing guidance and advice to students on how to pose questions based on the Socratic questioning prompt. This could be done through coaching and guidance on selecting the effective question techniques.

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