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## Synchronous discussion in online learning: Investigating students' critical thinking

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### Abstract:

Many studies mentioned the importance of fostering higher education students' critical thinking skills in order to prepare them for their future career. However, many scholars contend that in online courses, critical thinking is difficult to accomplish. Understanding this gap, this paper aims to report the use of Socratic Questions strategy on synchronous discussion as the bridge to promote students' critical thinking in online learning environment. Twenty two Diploma 3 students who enrolled in Intermediate Reading course participated in this study. Due to the spread of Covid-19 pandemic, this class was switched into online learning. To gather the data, the content of participants' individual post will be analysed to know the depth of students' critical thinking based on Yang et al.'s (2005) model. In addition, both quantitative and qualitative analysis of students' post will be applied to measure the effects of Socratic questioning on students' critical thinking in synchronous discussion in online learning. The result revealed that Socratic questions strategy were successfully improve students' depth of critical thinking.

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## 1. Introduction

When the corona pandemic spread, the teaching of all education level in Indonesia is switched to online learning. Experiencing this situation, the writers had to move their face-to-face foreign language learning into fully online class. Thus, the development of suitable online teaching strategies is needed to facilitate the goals of the teaching and learning. The objective of all kinds of education,

traditional, online, or blended learning, is to achieve specified learning outcomes through systematically educational experiences (Garrison & Cleveland-Innes, 2005). ȳp

Although the term of critical thinking (CT) has been widely used by researchers, some prefer using High Order Thinking Skill (HOTS) (Puteh & Hamid, 2014). In defining the term of CT, only limited research clearly stated about it, for example, Chee et al., (2009) stated that “CT is a complex process that requires higher levels of cognitive skills in the processing of information” (p.198). However, many researchers described the characteristics of critical thinkers. Some say that a person with critical thinking skills has the ability to think critically and rationally, addresses questions to infer the information logically, and solves problems effectively (Cojocariu & Butnaru, 2014; Facione, 2000). Clearly, a critical thinker tries understanding every situation he face, questions the information when he read or hear, and states solutions when he faces any problems.

In educational setting, researches mention the importance of the teaching of CT because critical thinkers are able to interpret better understanding the information, not just merely preserving the knowledge (Dwyer et al., 2014). In addition to this, CT skills are essential for students since “students who are able to think critically are able to solve problems effectively” (Snyder & Snyder, 2008, p.90) for their successfulness in workplace and personal lives.

Many studies showed that in online courses, it is challenging to obtain students’ high order thinking level. Thus, researches advocate that online discussion is an effective activity to promote students’ critical thinking skills (Bai, 2009; Richardson & Ice, 2010), or to build students’ cognitive skills (Darabi et al., 2011; Sautter, 2007). In addition to this, online discussion is also effective in providing the social interaction which the researchers believe as the deficiency of online learning (Darabi et al., 2011; Slagter van Tryon & Bishop, 2009).

Elder and Paul (1998) mention the relevance of Socratic question for CT skills as it is influential to the quality of judgement. Many Studies highlight the influence strategy to enhance CT skills is through oral interaction (Lee et al., 2014). Thus, Socratic questions will be a powerful method because if we intended to enhance students’ thinking, we must trigger their thinking by asking questions that forced them to ask more questions (Elder & Paul, 1998).

This study tried to observe the use of Socratic questions as a method to enhance students’ CT skills in synchronous online learning. Many previous studies investigate the effect of this method, such as Yang et al., (2010) and Lee et al., (2014). Yang et al., (2010) conducted a mixed-method research to analyze CT in asynchronous online class discussion in computer conferencing. In addition, Lee et al., (2014) investigated the impact of Socratic questioning on students’ CT skills that was analyzed in two ways – the content analysis of their post and the analysis of their discussion flow. However, both previous research reported that the use of Socratic questioning show a positive result. Differently, this study only focused on the students’ depth of CT in synchronous class discussion that was posted on group chat application. Thus, the specific research objective is to explore how effective Socratic questioning is in online learning.

## **2. Method**

### **2.1. Participants**

Twenty two Diploma 3 students who enrolled in Intermediate Reading class at a private university in Malang, Indonesia, participated in this study. Then they were assigned to conventional online discussion with a given topic in the first week. In the second week, they were asked to discuss a certain topic and the lecturer provide Socratic questions during their discussion.

### **2.2. Procedures**

The class session was conducted through synchronous online learning. They were required to discuss the specific topic posted by the lecturer. Of this discussion topic, the teacher used case-based discussion. Students were required to post one authentic problem solving by analysing the issues given. During the second week discussion, the lecturer provided Socratic questioning. Otherwise, during the regular group discussion, the lecturer did not give any feedback. The following are the illustration of the lecturer's questions that adopted from Paul, 1990 Socratic questioning taxonomy (in Lee et al., 2014):

#### 1) Questions of Clarification

Students 1: Yes, it is an uncommon situation for many couples who change their gender roles, but however, they did it, not only just because women are more diligent than a man, but probably the job description is suitable for women. I can't say that this uncommon thing is right to do, but I also can't say that it is wrong tho. Why? Because in my opinion, exchanging roles in relationships are okay tho, but in a good portion. Not all jobs are for men, but also not all jobs are for women. It depends on the couples who did the exchange of roles. In my other perspective, these roles exchange cannot be accepted because I've learned our ancestor's tradition, and there was no reason for doing some kind of "roles exchange" in a relationship. But however, we cannot refuse this "new normal exchange" which is very uncommon for us. Then, just try to be consistent with each job-desk which is suitable for each of the couples. By the way, if this was happening in Indonesia, maybe it was the side-effect of emancipation, 'cause since from that era, every woman can do every man's job, even though not all kinds of jobs they did.

Lecturer: You mentioned emancipation, what is the correlation to this issues? Explain more.

#### 2) Questions that probe reasons and evidence

Students 2: In my opinion, changing gender roles are uncommon today is a prevalent things because people nowadays mind are more advanced, so they will think like "if I can do it for my partner, why not? It's not about "these are women's roles, women

should do it, woman shouldn't do it, these are man's roles, man should do it, man shouldn't do it" so I will do anything that can relieve my partner in our household"

Lecturer: Could you give any evidence of your perspective?

3) Questions that probe assumption

Students 3: In my opinion, regarding gender are nothing new today. Men and women are different in some ways, but women and men are still human. indeed gender is highly considered in this life. If the work of women is done by men or vice versa it is a natural thing. At this time, many companies still prioritize men to hold high positions. Not all men's work can be done by women and vice versa. But today we must think realistically for mutual interests and comfort. In psychology, it is also explained that the relationship between husband and wife has their own right to help one another in all situations of domestic work, as long as both parties are comfortable and do not make a problem of it to cause problems. So, men and women are indeed different but choosing the things done is a free right from each individual. comfort in choosing things to do is very important and if it can complement each other will provide its own benefits for each individual.

Lecturer: You mentioned that there are many companies that prefer to choose a man to sit in the high position, how would you justify this?

4) Questions about viewpoints or perspectives

Students 4: Changing gender roles is not so uncommon nowadays. People are started to think that the role between male and female is also the part of gender equality. I strongly agree to the part of the article that said "It is perfectly fine if each member of a couple is comfortable with such a distribution of roles, temporary or permanent" because it is suitable for the household. I will give an example that the Indonesian societies have said a lot that the household chore should be done by the wife such as cooking, cleaning, etc. These stereotypes have been around for so long in the society. What makes me disagree about that is because it is related to patriarchy where the men hold primary power and predominate in roles of political leadership, moral authority, social privilege and control of property, while the women are subjugated. Meanwhile the household chore should be done by the wife and the husband. Because when it comes to marriage life situation there's no term where "the husband helps the wife cleaning, taking care of children etc". the word "help" is not suitable here because it's their house, their children therefore they should done that together as a partner, not only for the wife. Also Pew Research Centre shown that women make up almost half of the U.S. labour force, and in 2012 nearly as many working-aged women (68%) as men (79%) were in the labour force. Yes it is a mandatory that the husband should provide to his wife but it is

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okay for women to have a job and not fully doing the household chore. It's good for them when the wife is divorced from her husband because they are no longer depend on their husband where they already have income for themselves and raise their children. Once again, household should be done by the both wife and husband as a partner. If the husband want to be treated as a king, treat the wife as the queen and vice versa.

Lecturer: What if other see this another way. What would he/she who disagree might say?

#### 5) Questions that probe implications and consequences

Students 5: In my opinion, housework is not an activity which is doing by one gender. But it's a job that everyone can do from children to adults. What makes cooking, washing dishes and cleaning the house become women's work, as perceptions shared by some people? There is no specific reason. Such division is only made by a group of people. So, it depends on every perception. In terms of education or employment, at this time women's opportunities get high access like men the greater it is. if the couple doesn't mind it, it will be fine. But if for the social status, it might be affect. It depends on every culture too. But, in Indonesia most emphasize that men must work, and women are more patient in doing homework and caring for children.

Lecturer: What did you imply by mentioning 'social status'?

### 2.3. Data analysis

To analyse the depth of CT on students' individual post, a model based on Yang et al. (2005) was used. The content analysis was students' post on the group chat. Table 1 presents the tag codes and its description to analyse the depth of CT based on Yang et al. (2005) model.

**Table 1.** Yang et al. (2005) analysis model for analysing the depth of CT

	Tag codes	Descriptions
Relevance	R+	Relevant statements to the issue discussed
	R-	Totally irrelevant statements to the issue discussed
Importance/ Significance	I+	Important/significant points/issues
	I-	Totally unimportant, trivial points/issues
Novety	N+	Provide new information, ideas or solutions that have never been mentioned (even if they are not important or useful).
	N-	Repeat what has already been said without any further exploration.
Accuracy	A+	The references/literature used or information/data collected to support the participant's position are accurate and true
	A-	The references/literature used or information/data collected to support the participant's position are clearly false

Justification	J+	Provide a statement of opinion, agreement or disagreement with supporting reasons/examples/justifications/proof
	J-	Statement with simple agreement, disagreement or alternative opinions without elaboration
Critical Assessment	C+	Critical assessment/evaluation of one's own previous statements/reflection or others' contributions towards the issue discussed
	C-	Uncritical or unreasoned acceptance/rejection

### 3. Result and discussion

#### 3.1. Result

Table 2 presents the depth of students' CT that was analysed to see the difference between the students' posts in which the lecturer applied Socratic questions and those in which the lecturer did not. There were 240 students' messages. All the messages were analysed using Yang et al. (2005) critical thinking indicators: Relevance, Importance, Novelty, Accuracy, Justification, and Critical Assessment.

In the first category, Relevance, the difference between the messages posted with the use of Socratic questions was 13.6%. In addition to this, 100% of the postings were related to the topic given. Meanwhile, in Socratic questions posting, almost 94.4% of students' messages told about significant issues compared to the conventional strategy messages that were only 63.6% post were important. Surprisingly, in the third category, Novelty, students post in Socratic questions were lower than in the other group. Even it was not significance difference, however, students performed better in the first discussion in which the lecture did not apply Socratic question. In term of the Accuracy, there is no significant difference. On the other hand, there were significant improvement with or without the use if Socratic strategy on Justification and Critical assessment category. While 100% of students' post with the use of Socratic questions provided supporting reason, only 63.6% of students' messages on conventional discussion with proof statements. In the case of Critical assessment, 83.3% posts were showed critical thinking process, while without the use of Socratic questions, only 45.5% of the post were critical.

**Table 2.** The depth of students' critical thinking

		Tag codes	Frequency	Depth of CT Ratio
Without Socratic questions (N=22 messages)	Relevance	R+	19	86.4
		R-	3	13.6
	Importance	I+	14	63.6
		I-	8	36.4
	Novelty	N+	20	90.9
		N-	2	9.1
	Accuracy	A+	10	45.5
		A-	12	54.5
	Justification	J+	14	63.6
		J-	8	36.4
	Critical Assessment	C+	10	45.5
		C-	12	54.5
Total			132	

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Using Socratic questions (N= 18 messages)	Relevance	R+	18	100
		R-	0	0
	Importance	I+	17	94.4
		I-	1	5.6
	Novelty	N+	15	83.3
		N-	3	16.7
	Accuracy	A+	8	44.4
		A-	10	55.6
	Justification	J+	18	100
		J-	0	0
Critical Assessment	C+	15	83.3	
	C-	3	16.7	
Total		108		

### 3.2. Discussion

This study intended to investigate the effectiveness of Socratic questions in improve students' CT skill. Bringing the difficulty to improve students' CT especially on online learning as an issue that need to be solved, the result was quite satisfactory. The current study revealed that Socratic questions was effective in promoting students' post in term of its relevance, importance, justification, and critical assessment. In line to this finding, Lee et al. (2014) also found that students' post on Socratic group were better on the term of its novelty, justified, and critical assessment compared to those who did not received this strategy.

On the contrary, there were no improvement on the accuracy of students' post. The result implied that there were not significant effect whether or not students' support their idea using accurate references. In addition to this, the result did not reveal any improvements in terms of the novelty of their post. Moreover, in the use of Socratic questions discussion, the new information given by the students was lower than the discussion without the existence of this strategy. There might be assumption from the absence of the novelty on students' post. It might be the result of the use the same subject for the research so that students felt uncomfortable to have another discussion.

## 4. Conclusion

Researches argue that CT is an important issue that needs to be solved. As educators, the improvement of students' CT skill should be taken into account. Bringing this issue, the current study tried to investigate students' depth of CT using Socratic questions on online learning environment. The result showed that there were significant improvement by using Socratic questions on students synchronous discussion. This study also have some limitations. First, the subject of the study were only a small number of students. Thus, future studies are expected to have a larger number of subject. Second, the subjects of this study were the same students for both control and experimental class.

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