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Abstract

Thinking critically as a student will confer many benefits in many areas of their learning process. Critical thinking skills play a crucial part of students' academic life- when reading, when writing, and when working with other students. The aim of critical thinking is to encourage the students to be independent learners and respon objectively to what they are reading or thinking through by weighing up all sides of an argument and evaluate its strengths and weaknesses. The question is how to do critical thinking in an effective way ? According to open university 2008, to think critically is to examine ideas, evaluate them, and make decisions about their merit. Thinking critically is a step to create strong arguments and to present and to justify based on the evidence evaluated. The intention of this paper is to review the use of questioning in developing the critical thinking skills in process of writing. The discussions will be gathered from various grounded theory and some studies that have applied questions exploration for critical thinking development.

INTRODUCTION

Some studies have indicated on the importance of critical thinking students have for their learning process. Critical thinking is generally claimed to be an essential requirement to effective learning and productive living (Belghiti K et al 2017). Students will get benefits in many areas of their academic life such as reading, writing and working with other students (open university, 2008) if they entail the critical thinking skills in the decision making. Based on Bloom's Taxonomy, students used critical thinking and is supported by data through argument and integrated reflection during scientific analysis.

In writing, developing ideas is one way for students to fight the writer's block. Even when the ideas for writing are already in their head, writing requires research and a great deal of organization, as well as creativity. Accordingly, all the processes for effective writing depend on how well the critical thinking skills have been developed. Thinking critically is a step to create strong arguments and to present and to justify based on the evidence evaluated (open university 2008). One way to achieve this is through questioning. The function of questioning makes students to engage in a process which promote thinking, productive learning, and content retention, if done in such a manner as to stir thought processes and stimulate the imagination (Smith, Rook, and Smith , 2008, p. 44). Tapper 2004 (in Vincke 2012) points out critical thinking is in terms of abilities or skills such as selection, evaluation, analysis, reflection, questioning, inference and judgment. Moreover, Santoso et al (2017) asserted that the ability to ask question skills of student has a strong correlation with students' critical thinking skills, where the various level questions that play an important role in critical thinking skills are on predictive levels, analysis, evaluation, and inference.

Previous study showed that critical thinking skills can be produced through a number of activities including giving well- designed assignments (Cavdar, Doe 2012), problem-based learning (Chen & Li 2015), topic familiarity (Indah 2017) and the function of an instructional rubric for peer evaluation (Daud 2012). In addition, a number of study has also expanded the use of teacher questions in the development of critical thinking skills. Posing teacher- led questions and answer approach that is considered as a good application on helping students in expressing the critical thinking skills (Lee, Da En 2015; Horowitz 2007; Etemadzadeh et al 2012). Therefore, this paper intends to investigate the review of the use of questions explorations in developing students' critical thinking in the writing performance. The discussions of this study will point out on viewing the previous research that have been conducted to building critical thinking skills.

LITERATURE REVIEW

The literature reviewed in this paper will identify the different conception critical thinking in many studies and discuss its role in writingskill. Questioning as part of the modes of critical thinking skills will also be explored in assissting the development of writing skill.

The Nature of Critical Thinking and Questioning

Critical thinking comes from the individuals' ability to think and to decide independently, contribute to build skills in argumentation, correct inference, approaching a problem from the various points of view, complying with the procedures of critical thinking, has a questioning approach that develops the higher level thinking skills and puts the individual in the center (Shirkhani & Fahim 2011, Cojocariu and Butnaru 2014, Islek & Hursen 2014). Used in this way, questioning can be undeniably powerful teaching approach. To what extent the questions, questioning technique and questioning sequences utilized by the teachers had on the development of critical thinking and the problem solving ability improve the way students more about what and how they were learning (Horowitz 2007). When trying to support students' demonstration of their higher order thinking skill, questions section is considerably challenges to the learning environment. In order to develop thinking, reasoning, and critical thinking, Aflalo (2018) stated that it is important to develop questioning. Questions are typically classified by the level of cognitive demand required to answer them (TEAL 2013). The best known system for categorizing the cognitive level of questions is Bloom's Taxonomy proposed in Aflalo (2018) which offers a hierarchy of questions ranging from knowledge questions, expressing the lowest order of thinking, to comprehension questions, application, analysis, synthesis, and evaluation. This Bloom's hierarchical levels is also stated in TEAL (2013) that questions are classified lower order questions ask students to recall and comprehend material that was previously read or taught by the teacher and higher order questions ask students to use information previously learned to create or support an answer with logically reasoned evidence. Both higher and lower order questions are useful and have their place in teaching- learning process.

The Role of Critical Thinking in Writing

Writing and critical thinking have gradually drawn attention from researchers in both domains to the possibility of integrating the teaching of both and it is considered that they play an important role in learning process. As Islek and Hursen (2014) indicate that the

important of critical thinking in education is to educate the students to be productive, creative, and to have critical thinking ability. In order to get well- designed writing, students are encouraged to reconsider concepts, critically evaluate assumptions, and undertake substantive revisions of their writing (Cavdar & Doe 2012). Therefore, it is important for teachers to understand the interconnection of the reseach as a conceptual foundation for embedding critical thinking an writing (Murray 2016).

Despite the articulated importance of critical thinking and writing over the past years, many researchers have expressed ther dissatisfaction with their students' competence in this two skills (Dong 2015). Jacobson and Lapp 2010 (in Murray 2016) find that the students are able to form sentences and summarize basic information, but struggle with the ability to organize and present ideas in a logical manner, to present a logical connection of details within a paragraph, and to critically analyze the causes and purpose solutions to problems. The lack of logic and critical analysis in students' writing arouse their concerns about the writing proficiency as well as their critical thinking competence. As to college students, many of them are considered to have left higher educational intitutes without acquiring the requisite proficiency in writing and critical thinking (Borglin 2012).

Critical thinking skills do not stand alone as this skill tail another skill namely language skills. Just as Indah (2017) indicated that critical thinking can be used to measure in speaking and writing competencies. The main point of critical thinking is one of the strongest impetuses for researchers who explore the cultivation of critical thinking among students of various levels and disciplinary backgrounds (Dong 2015). Sharadgah (2014) also claimed that when students struggle with writing tasks, their critical thinking skills were greatly developed. This suggests that critical thinking and its skills may be enhanced in the process of students' writing.

The literature about writing in relation to critical thinking is in line with the findings of some study. For example, Indah (2017)) stated, the higher the students' writing skill, the better reflection of their critical thinking skills will be. It is also revealed from Dong (2015), the result of critical thinking oriented in writing approach was effective for improving students' critical thinking scores. Cavdar and Doe (2012) encourage other instructors to consider the systematic use of writing to advance the development of better citizen- thinkers.

Discussion

Taxonomy of Questions

Questions have been classified into several taxonomies intended to describe their fundamental essence. For the purposes of teaching, these taxonomies can be used by educators to formulate questions intended to elicit specific cognitive processes. The basic way to characterize questions is to classify them as either convergent or divergent. A convergent question, often called a closed question, is intended to elicit a specific response or a narrow list of possible responses. Educators use convergent questions to draw a single "best" response from learners. In contrast, divergent questions, also known as open questions, elicit a wide range of responses that often require substantive elaboration. Divergent questions do not have a single "best" response. Educators use divergent questions to stimulate dialog and explore a range of issues related to the topic.

Another way to classify questions is to examine their cognitive level or complexity. A hierarchal approach to cognition was originally described by Bloom and subsequently modified by Anderson and Krathwohl. Questions may address various levels of cognition ranging from mere recall of memorized facts to processes that require deep critical thinking. Questions can, therefore, address various cognitive domains with the intent of achieving specific learning outcomes. Each domain is further categorized as lower or higher order in terms of cognitive difficulty.

Table 1

Classification of Questions Based on Cognition Dimension and Student Actions Required for Achieving Specific Learning Outcomes.

Cognitive Dimension	Cognitive Level	Action
Remembering (knowledge)	Low	List, name, identify, recognize
Understanding (comprehension)	Low	Summarize, explain, describe
Applying (application)	Low	Solve, illustrate, interpret
Analizing (analysis)	High	Analyze, compare, organize
Evaluating (evaluation)	High	Evaluate, criticize, justify
Creating (synthesis)	High	Design, hypothesize, plan

Student-generated Questions

Most questioning approaches focus on the teacher asking the questions. However, student-generated questions also can lead to deep learning. Requiring students to create their own questions can elicit a greater understanding of the course material. Rather than continually questioning students regarding the material, Bowker achieved content understanding by making declarative statements intended to elicit questions from students. When there were no definitive answers to the questions asked, students were expected to reflect on all possible answers, known and hypothetical, to gain a deeper knowledge of the material. Using this questioning strategy, students demonstrated greater thought complexity and engagement.

Another strategy is the questioning as thinking (QAT) framework where students are encouraged to generate questions to aid in their exploration or understanding of a subject matter. QAT incorporates both questioning and *think-aloud* learning strategies to support metacognition. Students are expected to independently monitor their learning by asking themselves questions such as, “What are my goals for learning?” and “Does this material make sense to me?” The think-aloud technique encourages students to verbalize their inner thoughts, thinking processes, and decision-making strategies. As students become more proficient in this exercise, they internalize the dialogue. Educators can facilitate QAT by modeling the relationship between questioning and thinking aloud. Using content material, a teacher can prepare an example think-aloud to demonstrate how multiple answers can stem from a question. The teacher should model the types of metacognitive questions that students must ask themselves. Once the QAT strategy has been modeled by the teacher, students are asked to formulate their own questions, answers, and thought processes during classroom discussions.

The literature about writing in relation to critical thinking is in line with the findings of some study. For example, Indah (2017)) stated, the better contemplation of students’ critical thinking derive from the more advanced writing skills they acquire with. It is also revealed from Dong (2015), The improvement of students’ critical thinking scores is effectively produced from the result of their critical thinking in writing ability. Moreover, Cavdar and Doe (2012) encourage other instructors to acknowledge the writing approach to promote the advancement of better critical thinker.

Conclusion

Teachers in classroom and experiential learning environments frequently use lower-order, recall-type questions, and the overuse of this type of question hampers efforts to

promote deeper, higher-order, critical thinking in students. Understanding the taxonomy of questions and best practice strategies may help pharmacy educators formulate a wider range of questions that not only stimulate the recall of important factual, conceptual, and procedural knowledge but also requires learners to analyze, evaluate, and create. Greater attention to metacognition and the learner's personal responses through effective questions can lead students to deep insights. The clarity, sequencing, and delivery of questions, and the psychological safety of the learning environment influence student perceptions, motivation, and achievement of desired educational outcomes. Questions are among the most powerful teaching tools and adopting best practices can significantly enhance the quality of instruction.

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