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Perception of Basic Level Teachers' on Critical Thinking (CT) Strategies

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Abstract:

The perception of basic level teachers in mathematics is a qualitative study. 5 basic level teachers were chosen purposively who had participated in 5 days CT training. The basic level teachers' perceived critical thinking (CT) as a sequential process of developing cognitive skills and problem solving among the students. The teaching CT to their students provides the intellectual stimuli that will facilitate thinking alternative way in mathematics with increasing the ability of explaining the ideas and concepts in their own words linking with context. Although the students in classroom present their ideas and in pairs and in groups with logical thinking and solve problems using new approaches are less demonstrated in assessment. The materials presented developed the cognitive skills to gain understanding and assimilate the ideas.

Key words: *perception, critical thinking, strategies, enjoyment, taxonomy*

Introduction

The curriculum of mathematics of school level has incorporated the different learner centered as well as teacher centered methods (CDC, 2005, 2076 BS). The emerging methodologies those the teachers administered in classroom instruction are crucial for conceptual understanding, autonomy and motivation (Fuentes-Cabrera et al., 2020). Different methods like as heuristic, cooperative, etc. not only help too understand conceptual knowledge but also to develop quality life with integrating and internalization of soft skills and life skills (Sultanova et al., 2021; Tambunan, 2018). It is observed that

most of the teachers in our context use teacher centered as well as the chalk talk method in teaching mathematics both in school as well as higher level.

Critical Thinking (CT) was first highlighted by Benjamin Bloom's taxonomy a few decades ago (Duron et al., 2006; Lauer, 2005). It was perceived that a higher level of cognitive ability involving CT was a feature in the *analysis, synthesis,* and *evaluation* levels while lower levels of cognitive ability that is *knowledge, comprehension,* and *application* only involved remembering, relating and applying information respectively (Duron et al., 2006). CT involves the development of dispositions which, among other things, include probing, inquisitiveness and keenness of mind with the development and application of interrelated cognitive and meta-cognitive skills involved in problem solving, understanding and expressing meaning, identifying relationships, assessing credibility of statements, and decision making in developing habits of mind (Costa & Kallick, 2009).

Duron et al. (2006) pointed out that the lecture format of learning a popular approach in higher education may not encourage active learning of CT on the part of students. For students to think critically and learn actively, teachers must give up the perception that students cannot learn unless a teacher covers it. However, many teachers still perceive that students need to be taught before they can learn (Choy & Troudi, 2006). Teachers should also be flexible and show students that there is often more than one solution to a problem (Abrami et al., 2015; Black, 2005). Riddell (2007) noted that CT should not be defined but explained by its components and features, stages, and characteristics as how CT experts have done. The teachers CT practice and therefore, it is important to consider the influence of teacher perceptions of how students learn. The meaning of CT can also be summarized from past researches as a reflection; identification and appraisal of assumptions; inquiry, interpretation and analysis; and reasoning and judgment; with the consideration of context. Therefore, CT is a complex process that requires higher levels of cognitive skills in the processing of information.

Perception may be defined as "the process by which we extract meaningful information from physical stimulation. It is the way we interpret our sensations". The three important points about perception were stated. Firstly, it is determined by an individual's experience, intention, and social needs. Secondly, the perceiver is not passive and

indifferent when perceiving something and lastly a higher mental process which helps an individual build up a model of his or her world in order to help anticipate and deal future events (Ugwuegbu & Gerada, 1980).

Drawing the concept of CT is social in nature. This type of thinking does not occur without interaction and sharing with others (Choy & Cheah, 2009). Therefore CT requires reflection followed by interaction within group and between groups. The main purpose of my study was to explore the basic level teachers' perceptions on critical thinking strategies in teaching mathematics.

Methods

This study is qualitative and interpretive in nature. Four mathematics teachers who were participated training of CT strategies in teaching mathematics were selected purposively as sample of the study. The data were collected by using the focus group discussion. The data were transcribed ad placed into categories. Finally themes and sub themes were developed. Member check was conducted for consistency.

Results and Discussion

I have designed this study to examine the mathematic teachers' perception and practice of critical methods in school level. CT has been regarded as effective way of promoting students learning as well as performance. I have described the teachers' perceptions as follows:

Concept of CT

The teachers defined CT as the intellectual stimuli which become the impetus to facilitate thinking among students in the classroom and enable students to enjoy the process of learning. They also described this as a process that involves analyzing information. For example,

CT is a method or a way of thinking that maximizes the outcome or results. It also enables students to enjoy their studies and encourages them to produce satisfying results and analyze information. (T1)

CT involves logical reasoning, compare and contrast. Not simply accepting the norm rather needing to reason and justify answers. CT plays a significant role. The students analyze information and solve problems using critical thinking (T2).

Teachers primarily viewed Critical Thinking (CT) as a method that enhances students' enjoyment of learning and improves learning outcomes. However, they did not specify the depth of learning they aimed for. They focused on acquiring knowledge, reasoning, and analysis, rather than reflecting and making appraisals. They did not use words like reflection or appraisal in their definition of CT. Riddell (2007) noted are important components of CT apart from ability to analyze and reason.

Practicing CT

The respondents were certain that practicing CT in their classrooms brings positive results. Their thought on CT, students would be able to gain in-depth understanding of the subjects they were learning and apply what they have learned in real life.

I feel that CT plays an important role in the learning process. If students are able to think critically, they will be able to perform better in class. The lack of application skills, I believe comes from the fact that they do not think critically but mere memorizing.(T3)

I feel it is important for students to be taught critical thinking. However, a conducive environment must be created to help with this process. I think schools today do not have this type of environment today.(T4)

From the results obtained, it would seem that most of the respondents perceived that CT is an important component of the learning process. None of the respondents, however, gave a clear idea of CT other than it involved analysis and reasoning. It was noted that CT involves higher level thinking skills and involves complex processing of information (Duron et al., 2006; Riddell, 2007) .

Students' Demonstration and engagement

The teachers knew that their students were practicing CT when they were able to defend their arguments and problem solve using new approaches.

> *I know that CT is happening when new facts, thoughts and ideas are discussed when the students present or defend their argument from a new point of view. They may also solve problems using different or new approaches.(T2)*

On a similar note another respondent wrote,

> *The occurrence of CT is reflected in the structure, organization and sequence of logic and steps shown in students' solutions to a particular problem. Posing relevant questions could also be an instrument for identifying the existence of critical thinking.*

According to respondents perceived that students demonstrated CT when they were able to perceive facts thoughts and ideas from a new perspective and defend these ideas with sound argument. These students do not seem to reflect the skills that Riddell (2007) and Duron et al. (2006) argued are necessary to demonstrate critical thinking. According to these researchers, it is important to have skills like reflection, inquiry, interpretation, and analysis.

Teachers personal experience

A teachers' opinions reflect the difficulties found when carrying out the CT strategies, but another third of them positively value the effects that the Cooperative learning produces when is put into practice. What teachers most value from the CL is the better attitude towards Mathematics that their students develop, as well as an improvement of the social relations established in the group-class. The improvement in the school performance of their students also occupies an important place in their statements.

The category that teachers emphasize more is the one that refers to the improvement of the attitude to Mathematics and the improvement of students' motivation. Teachers state it as follows:

> *A great majority of students affirm that they prefer this methodology. I consider this very important because, at this age, one of the problems I must face is motivation; it is difficult to achieve that boys and girls feel comfortable in class, even more in Mathematics. From my point of view, to manage those students feel happy and motivated is a success of this methodology.*

Another teacher continues in the same vein stating:

> *Perhaps, the improvement of students' motivation is what I value most of this methodology and also that students value most. They say that they feel good and that fact in teenagers which are pure feeling! If they do not feel things is a bad sign ... Then, if we achieve that they feel ok in our classes I have made an important progress. Maybe this is what I value the most.*

In any case, it is very difficult to make some students feel motivated. The next teacher describes it as follows:

> *I am talking of students who are completely indifferent, not only towards Mathematics. I think that many times the fact that these students form part of a certain group does not help them or their classmates at all.*

I also find on many occasions references to the positive valuation that teachers make about the co-operation among team mates. The following teacher summarizes it as follows:

> *Besides explaining things to each other, they do not hesitate to make the classmate repeat the explanation or to ask doubts that they would not ask to the teacher in the middle of an explanation for several reasons: shyness, not interrupting, for fear to ask silly thing, etc.*

This other teacher insists on the same arguments:

> *It promotes a more positive attitude towards the subject because it enables to find help when needed or to give it when asked, since it is less difficult asking a classmate than the teacher because of shyness or fear to ask something that would seem a silly thing and that would provoke the laugh of the rest.*

Of course, something may be done as this teacher points out:

> *Thus it is difficult to accept this way of working as something habitual, in which it is as important to help as being helped. It is a matter of patience and insistence to make the student work cooperatively because he is not going to do it easily any day now.*

In any case, teachers do develop proposals to improve the evaluation system; such proposals are basically focused on avoiding that any student feels disadvantaged. Also the peer observation and self-evaluation of the students are also admired for students.

Students assessment and evaluation

The process of evaluation of students in group was also a focus point of teacher's experiences. According to them when the teachers ask the question to a group, each member of the group were not properly involving in searching the solution. Only limited students present the group voice. That is why; the each and every student was not properly assisted.

Some teachers show a notable disagreement with the evaluation criteria established in cooperative learning and teachers also reflect it. The next teacher summarizes it:

> *One of the most important disadvantages that students find is the evaluation method and those students with a higher performance do not consider fair to have to lower their marks just because the rest of the group has not obtained better results, and this is emphasized when a group member shows lack of interest in the subject or does not respect the work of others.*

Teachers find in this issue a justification of the difficulties that students show in this field: 'The system has indeed caused that the student only works to obtain a mark and there are few students with intrinsic motivation, that is to say, that work to learn how to learn.

Conclusion

Teachers believe they are teaching Critical Thinking (CT) to their students, believing it will facilitate learning. However, this perception is questionable as CT requires students to analyze their own thinking according to clarity, accuracy, relevance, logic, and fairness. CT requires teachers to have in-depth knowledge of CT skills and incorporate it into lessons for students to adapt. Teachers also perceive their students as unwilling to share and lack the command of language to express their thoughts well. They also find students disinterested in classes that require critical thinking. The results suggest a need for teachers to improve their understanding of CT to effectively teach students to think critically. CT is a continuous learning process that needs constant practice and incorporation into daily lessons. Further studies are needed to understand how teachers perceive meeting expected requirements and time constraints.

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