

ENHANCING STUDENTS' CRITICAL THINKING SKILLS IN THE 21ST CENTURY

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Abstract

Thinking and critical thinking are concepts in cognitive psychology that seem to mean the same thing to a lay man but are actually different in function. Whereas, everybody can think, not everybody can engage in critical thinking. That fact alone distinguishes one learner from another. Critical thinking does not just occur in the individual rather it could be brought about by exposure and instruction. This paper therefore discusses the concept of critical thinking, its relevance in the 21st century in the education of the child, the model of critical thinking, its implementation in the classroom teacher's role and students' role, teaching strategies/techniques of impacting critical thinking to learners. Finally, some recommendations were made. Among them are: that the child right from infancy should be provided with instructional materials that promote critical thinking and reasoning; that instruction on thinking and reasoning be introduced at the primary school at least primary four as early exposure will help learners to acquire the skills quiet early in life; that teachers should be trained in the effective use of instructional approaches that enhance critical thinking; that Government should flood our Primary and Secondary Schools with gadgets and playing materials that simulate critical thinking.

Introduction

Thinking is one concept everybody claims to know. Most of the time people talk about it in diverse ways such as: telling somebody that he/she has no thinking faculty or that a person is an idiot, meaning that the person does not reason well. Thinking is an action one performs every now and then. Colman (2003,741) defines thinking as "the act or process of having ideas or thoughts, including reasoning, problem-solving, decision making, the formation of mental models, and the contemplation of knowledge, beliefs, and opinions". Whereas everybody can think but not everybody engages in critical thinking. Critical thinking is a higher form of thinking that is highly productive in that it enables one to solve lives' problems. Ability to solve problems is what distinguishes a critical thinker from an ordinary thinker. Lahey (2004) describes a successful person as one who has problems and is able to solve most of his/her problems. Critical thinking enables the possessor to solve most problems or challenges. That means that people who do not possess the

skills of critical thinking are likely to quit at the slightest challenge. Even when they attempt solving problems, they may end up doing them shabbily or haphazardly.

Critical thinking has been defined as “the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by observation, experience, reflection, reasoning, or communication, as a guide to belief and action” (Scriven cited in Walker, 2002,2). The implication of the above definition is that critical thinking is something that one consciously learns and applies stringently. In languages, it can be defined as the ability to comprehend the logical connections among ideas, words, phrases, and concepts (Danesi, 2015). Encyclopedia Britannica (2014,2) states that critical thinking involves “thinking critically, thinking clearly with accuracy and precision; thinking carefully with logic and depth; and thinking open-mindedly by examining points of view and acknowledging assumptions and biases”. Educationally, Kennedy, Fisher and Ennis cited in Lai (2011) opined that the three highest levels of Benjamin Bloom’s taxonomy analysis, synthesis, and evaluation represent critical thinking. Santrock (2006) sees critical thinking as the ability to think reflectively and productively, as well as evaluating the evidence. From the foregoing, it is very obvious that critical thinking skills are what one consciously and socially desires and acquires with a view to making great impacts in life. The question then is whether those skills are taught in Nigerian schools; if yes, to what extent? Unfortunately the answer is no and that explains why most tertiary institutions in Nigeria churn out school leavers who are not employable and productive and this has greatly affected the nation’s economy and development.

The reason for the above scenario especially in education is the methods of instruction obtainable in most Nigerian schools. There is no gainsaying that most instructional approaches in use in the school system are conventional/traditional and therefore teaches facts and encourages learners to absorb them rather than guiding them to critically look at the so-called facts and come out with something better. Chukwunyenun seems to agree with above statements when he wrote that the traditional way of teaching in some Nigerian schools are teacher-centre approaches. He explained that those methods most of the time involves “repetition and memorization of previously taught material by filling the students’ minds with knowledge without explaining in detail the process of analyzing, evaluating and arriving at a conclusion” (2013,19). Therefore, enhancing learners’ critical thinking skills is very relevant in the 21st century due to emerging technology. Children need to decipher and sift the enormous information in order to get the best out of it.

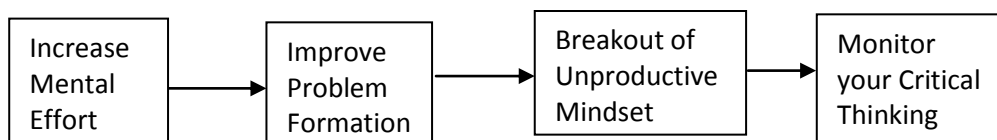
Furthermore, It is evident that the youth as well adults do not possess critical thinking skills. Unfortunately, most of the problems that crop up at various sectors of the nation are usually not solved most of the time because of people’s inability to solve to them. For instance, learners even in higher education due to their inability to solve academic problems resort to various forms exam-malpractice. Ability to solve problems is dependent upon the individual’s ability to think and reason. No wonder some students who lack critical thinking skills depend so much on the few resilient ones who either by omission or commission possess minimal thinking skills. Only a

handful of such learners can face squarely their academic challenges. Also, among the workforce, there is unproductivity as a result of workers inability to be creative and innovative. Yet, among the ruling class, one sees recycling of policies, lack of focus, lack of initiative and general inability to articulate and their attendant bad governance. Some leaders and stakeholders of some public institutions are not left out in this scenario. Rowles, Morgan, Burns, and Merchant; Choy & Cheah; Henderson Hurley and Hurley cited in Crockett (2015) observed that critical thinking is an intellectual and practical skill that most students in tertiary institutions and the workforce are lacking both in function and in understanding of the concept.

It is through education that the above problems will be solved. Until the nation enshrines in its curriculum the teaching of critical thinking skills and other related strategies, inability to solve problems will continue to challenge individual and societal development. Greenspan cited in Baylon (2014,1) states that “one of the aims of education for the 21st Century is to cultivate the problem solving, higher-order thinking and critical thinking skills necessary for students to adapt to the rapidly changing information age”. Therefore, the researchers believe that the teaching of critical thinking skills to learners right from the primary school level would go a long way to some solving all or some of the identified problems.

This paper therefore discusses ways of enhancing critical thinking under the following subheading: model of critical thinking, implementation of critical thinking in the classroom, strategies of impacting critical thinking and finally, some recommendations are made.

Model of Critical Thinking



*Halpern (1998) in Santrock (2007)

Brief Explanation of the Model

The critical thinking model here presented is a modified model of critical thinking which has four solid steps, which when followed strictly by an independent learner or a teacher in the classroom would go a long way to equipping learners with life-long problem-solving skills. The steps are distinct as well as interrelated. An individual's successful acquisition of one would lead to the acquisition of the subsequent steps much easy. The various steps are discussed below:

1. Increase Mental Effort

According to Halpern (1998) in Santrock (2007) the first step in improving critical thinking is motivational and not cognitive. That suggests that there is need for one who wants to engage in critical thinking to be intrinsically or extrinsically motivated. The individual must see the need to acquire critical thinking skills. This is

necessary because the learning of critical thinking skills is usually rigorous and involving. This goes to say that facilitators must make the rationale behind the problem to be solved clear to learners and the task interesting and meaningful too. Critical thinking requires the willingness to engage in cognitive work. In other words, for anyone to make highly productive decisions, the person must of necessity move beyond his/her usual mental efforts to a much higher one. Sometimes, the motivation may come from one's desire to clear off the messes caused by irrational decisions.

2. Improve Problem Formation

According Halpern (1998), formulating a problem means that the individual should carefully choose his/her words well in such a way that can give the individual clue into possible solutions to the problem. He reported that experts on critical thinking advised that people should arrange their problems in two different or several ways before attempting to solve them. It is believed that a well stated problem suggests that one understands the problem situation and that will subsequently lead to the possible solutions. A popular adage says 'problem understood is problem solved. In other words, a good understanding of the problem on ground will help learners in problem formation. What learners should know here is that there are different ways of organizing and solving problems. Santrock (2006) supports the idea when he states that a well framed question leads to different solutions and that the formation of a problem is as important as the problem itself. To make this possible in the classroom, the teacher has to teach learners how to break down problems into component parts and doing so they must look out for details.

3. Breakout of unproductive mindsets

Mindsets may be referred to as the personalized approach to problem solving. The kind of mindset an individual has is largely dependent on the individual's exposure in life. Harpern (1998) describes it as the way an individual approaches or perceives problem. So the idea of sticking to a particular way of problem solving or performing a task could be referred to as an individual's mind set. It can also be defined as the state of mind of an individual concerning a thing, task or a person. Mindset becomes unproductive when it is outdated, irrelevant and non-fruitful. At that point, it should be discarded and replaced with a productive one. In other words, critical thinking makes one to be dynamic in one's approach to problem-solving. Critical thinking involves being divergent in thinking and reasoning.

4. Monitor Your Critical Thinking

This step emphasizes the views of Scriven cited in Walker (2002) on critical thinking. He sees it as an intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information.... This means that learners should be trained to monitor themselves to he/she engages in the above mentioned activities. This is a simple exercise one can do each time there is a problem to be solved. Santrock (2006) citing Halpern (1998) said people who are effective in critical thinking are aware that they are engaging in it. Critical

thinking is not as easy as every day thinking. It is a problem-solving exercise which one intentionally engages in with a view to finding a lasting solution to a felt problem. So this step suggests that critical thinkers monitor themselves very well in order ensure that they do not settle for any how solution. Practice they say makes perfect.

Implementation of the Critical Thinking Model in the Classroom

To implement the above in the classroom, the teacher and learners must be prepared to follow the steps sequentially and carefully for good result. Digest for Gifted Research (2014) observed that in the general education classroom, most activities take place in the knowledge and comprehension range with few opportunities for more advanced thinking. They explain that critical thinking is equivalent to higher-level thinking and it requires individuals to engage in more complex processes, frequently connected to the upper domains of Bloom's cognitive taxonomy (analysis, synthesis, and evaluation. Discussed below are the teacher's role and the learners' role in a critical thinking classroom:

Teacher/Learners' Role in a Critical Thinking Classroom

Discussed below are some vital roles teachers/facilitators and learners are supposed to play in a critical thinking classroom:

Step 1: Increase Mental Effort

The teacher explains to learners that before they can engage critical thinking, they must be ready to put in more effort than they have been doing. He/she informs them that critical thinking requires their willingness to engage in series of tasks and challenges that are cognitively related. It must be noted at this point that both the teacher and the students must be well motivated to face the challenges of critical thinking. Both must see the need for training in critical thinking. To motivate learners the more, the teacher tells them the benefits of critical thinking. He/she uses authentic and interesting learning materials to boost their motivation. Teachers should lead children to go beyond recalling facts, retelling stories in sequence to participating in more advanced work, including reading by exploring character motivation, comparing story plots for similarities and evaluating their own performance in various skill areas.

b) Improve Problem Formation

The teacher explains to student that their ability to arrange their problems in a clear and understandable way predicts the solving of such problem. He/she stresses the need for one to understand and arrange a problem well before attempting to solve it. This arrangement demands that one engages in convergent and divergent thinking as to understand every detail of the problem. If any student is able to resolve this step well, then the solution of whatever problem is sure. Doing this is usually very tasking and demanding; hence they do not bother trying it. Learners should be encouraged to be meticulous when it comes to problem formation. This is essential because any

mistake or disarrangement may lead to confusion. The teacher encourages collaboration among learners.

Step 3: Breakout of unproductive mindsets

The teacher explains to students what unproductive mindset means. He/she explains that it is the conventional way of solving problem either by an individual or a group of persons. He/she gives series of examples with the easy way people use in solving problems and points out their limitations. The teacher models before them how the different ways of solving one particular problem. He/she explains that thinking deeply and divergently on the problem at hand that leads to having many solutions to a problem; then out the many solutions, one picks the best. The teacher explains that it is not good to take the first solution that comes to mind.

Step 4: Monitor Your Critical Thinking

The teacher explains that monitoring critical thinking is just an exercise that requires self-monitoring or self-regulation. This step suggests that learners follow step by step approach when solving problem so that they can dictate any mistakes or omissions during the process. Learners must be conscious of the fact that they are engaging in critical thinking. They should be made to know that finding a solution to a problem is not the main thing in critical thinking; rather it is finding a lasting and productive solution. The facilitator should therefore encourage them to do the following: (1) state hypothesis (2) listen to or collect evidence in support of the hypothesis; (3) determine the strength of the arguments or information derived from the evidence (4) assess the underlying assumptions and possible biases supporting the hypothesis; and (5) arrive at a judgment and course of action where appropriate (Geertsens, 2003).

Some Recommended Teaching Strategies for Training in Critical Thinking

Emphasizing on the need to use techniques and pedagogy to enhance critical thinking, Tsai, Chen, Chang, & Chang in GDC Team (2014) explains that students' critical thinking will be improved when they are trained to look beyond what is happening to think about why they happening. This underscores the need for authentic and pragmatic instructional strategies which could help learners to point out why an answer or solution was arrived at. Lai (2011) citing various literatures advised that Instructors use cooperative or collaborative learning methods and constructivist approaches that place students at the center of the learning process when teaching for critical thinking.

They also add that instructors should use open-ended tasks or questions that incorporate real world and authentic problem context in constructing assessment for critical thinking. Kennedy et al. cited in Lai (2011) reports that instructional interventions used to improving students' critical thinking skills have generally shown positive results. Also, Abrami cited in Lai (2011) giving a meta-analysis of 117 empirical studies that examined the impact of instructional interventions on

students' critical thinking skills and dispositions found that these interventions, in general, have a positive impact, with a mean effect size of 0.34.

Based on the foregoing, this paper introduces the following 21st century instructional approaches/strategies for use in critical thinking classrooms; they are briefly explained here.

1. Classroom Assessment Techniques (CAT): Classroom assessment techniques (CATs) are teaching strategies that provide formative assessments of student learning. Here students are guided to assess their own learning in written or oral form. Simple assessment techniques should be taught to them to enable them assess one another. It has been argued that the use of CATs enhances and improves student learning. A study carried out by Baylon (2014) in which he sought to evaluate the classroom assessment employed by the teachers on the critical-thinking and academic performance of the students in the laboratory high schools (LHS) of Central Bicol State University of Agriculture, school year 2012-2013, the findings revealed that only 11 out of 50 types of classroom assessment techniques are being used in the two laboratory high schools of CBSUA, namely: CDE- LHS and CDE the other techniques used by the teachers were classified as low-order thinking skills. There were significant differences in the levels of critical thinking among the second year students in the two LHS along remembering, understanding, analyzing and evaluating while for third year high school students in the two LHS there was significant difference in evaluating but not significantly different with the rest of the levels. The above study settles the argument on whether classroom assessment improves critical thinking or not.

2. Cooperative Learning Strategy (CLS): This pedagogical approach enhances brainstorm or rubbing of mind with continuous support and feedback from other students and teachers. Students should be grouped on regular basis to discuss or handle issues that border on critical thinking. The facilitator should also ensure that everybody participates and is carried along. And that calls for proper supervision of classroom activities. At the end of every section, the facilitator and students take turns to give feedback on individual as well as group performance. Johnson, Johnson and Smith cited in Chatila and Husseiny (2016) report that recent research findings revealed that cooperative learning instructional strategy enhanced thinking skills of learners. Owing to the above, Lunenburg cited in Chatila and Husseiny (2016) states that cooperative learning strategy has been recommended by many scholars for use in the classroom to ensure sustainable knowledge of critical thinking,

3. Case study\Discussion: Case study discussion is a learner-driven active learning model where the instructor is no longer a repository of knowledge but a facilitator. Here the teacher is expected to present an inconclusive case or story to encourage students to discuss extensively on it. Like case study in research, learners are prompted to supply detailed information on an individual or institution. It encourages brainstorming. A story that is related to the problem about to be solved may be introduced in such a way that will generate extensive discussion and brainstorming.

Every learner should be carried along in this exercise. They can work through case studies individually or in groups. Whichever way the facilitator chooses, he/she should ensure that feedback is given at the appropriate time. Maloy and DeNatale cited in Cheong and Cheung (2008) report that research studies have shown that electronic discussion is effective in teaching critical thinking and can enhance students' understanding. Mansureh (2012) carried out a study on the effect of dialogic teaching methods (group discussion and Socratic dialogue) on University students' critical thinking disposition and social interaction. The findings showed that dialogic teaching methods improved six elements of critical thinking dispositions (analyticity, cognitive maturity, CT self-confidence, self- evaluation, open- mindedness, truth-seeking), and seven elements of social interaction (knowing each other, friendship and intimacy, tendency to dialogue, responsibility, class dynamism, interaction with teacher, intimacy with the instructor) of subjects. It should be noted that both real life and electronic dialogues are effective pedagogy for teaching critical thinking.

4. Questions: Studies have shown that skillful and effective use of questions and answers in the classroom can improve learners' critical thinking. A study by Shen (2012) on the effects of teachers' questions on the development of students' critical thinking attests to the above statement. The results indicated that the teacher asked more lower-cognitive questions (79.2%) than higher ones (20.8%); that excessive use of lower-cognitive questions could not facilitate the development of students' critical thinking and that higher cognitive questions were misused by the teacher. There is no gainsaying that 'questioning' is a powerful tool any competent teacher could use to expose learners to higher order thinking, problem-solving and critical thinking. Questions sharpen the brain and make it more alert. Thinking is driven by questions. To maximize the use of questions in the class, the teacher is expected to encourage students to ask reasonable open ended questions about issues and to think before they answer questions. This is why it is true that only students who ask questions are really thinking and learning.

5. Reciprocal Teaching and Peer Questioning

Reciprocal teaching refers to an instructional activity that takes place in the form of a dialogue between teachers and students regarding segments of text. The dialogue is structured by the use of four strategies: summarizing, question generating, clarifying, and predicting. In this case the dialogue is between students and they use one of the strategies of reciprocal teaching which is questioning. First, the teacher assigns learners into small groups and gives them task (problem situation) and learners are guided to generate questions on how to tackle the problem. A general topic is collectively chosen and each group deliberates on it through questioning. Students take turns to ask critically thought out questions that border on the description of the problem situation and its possible solutions. After that first phase, the secretary of every group comes out to present the groups' proposals and the entire class will consider their relevance. A study by Andi (2016) which aimed at investigating the effectiveness of reciprocal teaching strategy embedding critical thinking for students'

reading comprehension at the second grade of MIA at MAN affirmed the effectiveness of questions in critical thinking skills. Kendari cited in Andi (2016) found significant improvement in students' post-test scores, which means that reciprocal teaching strategy embedding critical thinking improved students' reading comprehension.

Conclusion

So far, this paper has attempted to discuss the concept of critical thinking and its relevance in the 21st century classroom. Critical thinking has been identified by many scholars as an effective instructional approach that a competent teacher could use to enhance academic achievement of learners. More so, studies have proven that it is very useful in teaching problem-solving skills. Above all, its use in the classroom will make lessons authentic, meaningful, purposeful, relevant and interesting to learners. This paper therefore calls on teachers, educators and other stake holders in education to view the teaching of critical thinking skills to learners at all levels of education as a task that must be done.

Recommendations

1. The child right from infancy should be provided with instructional materials that promote critical thinking.
2. Instructions on critical thinking should be introduced at the primary school at least primary four as early exposure will help learners to acquire the skills quiet early in life.
3. Teachers should be trained in the effective use of instructional approaches that enhance critical thinking through workshops and seminars.
4. Government/ proprietors should provide gadgets and playing materials that simulate critical thinking at schools.
5. Teachers should from time to time purposely demonstrate critical thinking by pondering aloud the most efficient way to solve academic problems through a method known as think-a-loud.
6. Parents/guardians should foster critical thinking in their children at home by engaging them in varied discussions on issues that are of interest to children. To do this effectively, parents need some form of training. This can be done during Parents' Teachers Association (PTA) forums etc.
7. Parents should foster critical thinking in their children at home by engaging them in varied discussions on issues that are of interest to children.
8. Parents should listen to their children in a bid to find out how they make sense of the world as that would enable them understand the critical thinking skills their children possess as well as know the type of interventions to give.
9. Furthermore, parents should from time to time purposely demonstrate critical thinking by pondering aloud the most efficient way to do house hold chores.

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