Importance of Critical Thinking Skills for Domain Specificity-*A Review of Literature*

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Original Research Article

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Abstract: This study investigates the importance of critical thinking skills for domain specificity. A theatrical research is carried out to highlight the use of critical thinking skills for domain specificity. Literature highlights that students use their critical thinking skills in a specific domain and perform better in classroom and at work place. Literature further highlights that teachers must facilitate students in the knowledge of critical thinking skills by using their own critical faculties. Likewise, advocates of critical thinking stress that institutes must produce critical thinkers. Literature focuses on domain specificity for the use of critical thinking skills. Studies show that in a specific domain learners critically comprehend, analyze, infer and evaluate text and finally become critical thinkers in a specific domain.
Keywords: Critical thinking skills, domain specificity, critical thinkers

Introduction

Critical thinking is an important factor in the advancement of students' learning. In this rapidly changing world, students who are good at using critical thinking skills they perform better everywhere. The aim of this study is to explore the effectiveness of critical thinking skills for domain specificity. The objective of the study is to throw light on the significance of domain specificity with the use of critical thinking skills. The significance of the study shows that teachers and learners must consider critical thinking skills for domain specificity.

Definition of Critical Thinking

Paul [1] defines critical thinking in terms of 'perfection of thought' while in the 16th century Bacon defines critical thinking in the following manners:

Critical thinking is a desire to seek, patience to doubt, fondness to meditate, slowness to assert, readiness to consider, carefulness to dispose and set in order; and hatred for every kind of imposture [2].

Descartes (17th century) claims that critical thinking is, ''discipline of the mind'' in order to guide thinking process [3]. Likewise, Dewey [4] defines critical thinking in terms of ''active, persistent and careful consideration of a belief or supposed form of knowledge in the light of the grounds which support it and further conclusions to which it tends''. In addition, Bailin, Case, Coombs and Daniels [5], Limpon [6] and Paul (1) assert that critical thinking is, ''self-correcting'', ''self-directed'', and ''goal-directed'' while Carey, Foltz and Allen [7, 8,] assert, ''ultimately, it is not we who define thinking. It is thinking that defines us''. Similarly, Halpern [9] states:

Critical thinking is the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to desire thinking that is purposeful, reasoned, and goal directed-the kind of thinking involved in solving problems, formulating inference, calculating likelihood and making decisions.

Ennis [10] takes critical thinking in terms of ''reasonable reflective thinking that focuses on what to believe or do'' while Hooks [11] says, '' the heartbeat of critical thinking is the longing to know- to understand how life works''. He further says that thinking is an action; thoughts are like a laboratory where one asks questions and finds answers in order to share with others. Moreover, Paul and Elder [12] take critical thinking in the following manners:

…being the disciplined art of ensuring that you use the best thinking you are capable of in any set of circumstances. The general goal of thinking is to figure out the lay of the land. We all have choices to make. We need the best information to make the best choices.

Facione's [13] extract from the Delphi report unveils the specialty of critical thinking skills which focuses on cognitive and affective domain of human faculty. The extract is as under:

We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based…

Facione [13] further states that critical thinking is persistent in seeking results which are precise. Similarly, McPeck [14] classifies critical thinking as, ''the appropriate use of reflective skepticism'' while Lipman [15] states that critical thinking facilitates good judgment.

In the above mentioned arguments, it is noticed that critical thinking relates to a person's disposition, mind and cognitive skills in order to take rational decisions and to reflect on an issue with purposeful thinking.

Importance of Critical Thinking Skills in Education

Mcpeck [14] and Siegel [16] regard critical thinking as a dispensable part of education and being able to think critically is necessary for being considered educated [17]. These philosophers say that teaching is only a way to satisfy the moral injunction of respect for individual which must apply to individuals. It is students' right to learning that they must be taught how to think critically. Hence, Siegel's [16] insistence is on students' right to question in the class to facilitate and develop critical faculty. Notably, students can better function within society; evaluate the validity of information available, make better personal, business and leadership decisions [18, 9, 19, 20].

On the other hand, some scholars such as Fang et al. [21] Huang and Lee [22] and Liaw [23] have implemented critical thinking pedagogy in higher education. Hence, many scholars found that there are several reasons to this complex problem [24, 25]. Focusing on 'complex problems', Shen et al., [26] states that students' previous learning habits are reproduction oriented and they are rarely given chance to question, evaluate and explain the knowledge instructed in the classroom because students are adapted to collectivist society where individuality in thought and action is not valued [27].

Walsh [28] asserts, "students and teachers together are in control of and actively engaged in shaping the pedagogy, in learning about themselves, their realities, the social world, in developing collective analyses, and in working towards structural transformation". It highlights the transformation of teaching and learning. Dewey [4] states that the purpose of education is to think critically. Likewise, Scriven [29] asserts, "training in critical thinking should be the primary task of education''.

Lipman [15] states that critical thinking facilitates good judgment. Facione, Sanchez, and Facione [30] report a consensus of critical thinkers on critical thinking. According to them, in institutes teachers must teach learners and must produce such type of learners who want to use their cognitive skills. Willingham [23] says that students may exhibit critical thinking in one context but fail to use in another context. He means that students are unable to transfer critical thinking out of a specific domain. Nickerson [31] explains that it is all about teaching of critical thinking that how students are taught critical thinking.

Critical thinking involves using criteria for evaluating one's thoughts [32,15]. These criteria depend on the domain of interest [15]. These criteria are 'perfection of thought' which communicates to students the ''quality of thought'' regarding ''clarity, accuracy, precision, specificity, relevance, consistency, logic, depth, completeness, significance, fairness, and adequacy'' [1].

Critical Thinking and Creativity

Many researchers have made a connection between critical thinking and creativity [5, 6, 33, 34, 35]. Like, critical thinking and creativity are aspect of 'good' purposeful thinking [34]. They explain that thinking requires abilities to generate products which is a part of creativity along with which requires the learners to be critical about the quality of that product. They stress, "critical thinking without creativity reduces to mere skepticism and negativity, and creativity without critical thought reduces to mere novelty". Both believe in that critical thinking and creativity must be considered during instructions [36].

Many scholars also claim that critical thinking plays an important role in students' academic performance and it is considered authentic for language acquisition for the improvement of reading and writing skills [37, 38, 39, 34, 40, 41, 42]. The ability to think critically is a person's success towards his survival and is the foundation of education [21,15,43,44].

Teaching of Critical Thinking Skills

In education, the most important element is teaching and learning. Teachers must possess good pedagogical skills in order to teach critical thinking skills [45, 46, 20, 40]. Paul [43] asserts that effective teaching of critical thinking requires that teachers must avoid 'teaching by telling' and 'learning by memorizing'. Teaching of good critical thinking skills

demands constructive teachers who possess critical pedagogical skills and who aim to teach critical skills while engaging students in critical thinking process.

To teach critical thinking skills and to engage students in thinking process, questioning is essential [47, 20, 48, 49, 43]. However, not all questions cater to students critical thinking skills. According to Ritchhart [50], Review and Procedural questions simply asks for students' content comprehension and verification of tasks and do little in developing students' critical thinking. On the other hand, Socratic fertile questions [43,41] can be viewed as 'powerful questions' because these questions evoke awareness and engagement in students' mind. However, powerful questions definitely connect with critical thinking because '' the art of questioning is important to excellence of thought'' [27]. Questioning always develops learners' critical thinking [52, 53, 54, 45, 43, 55]. Asking questions in classrooms develops interaction among the students and as interaction progresses; students' critical thinking improves [56, 27, 23].

Importance of Critical Thinking Skills for Domain Specificity

Advocates of domain specificity like Ennis [58], Willingham [23] and Bailin [59] argue that general instructions in critical thinking are successful because critical thinking requires domain specific knowledge. It would be easier to learn in order to think critically within a given domain while domain specific knowledge is important for critical thinking skills, respectively. Likewise, McPeck [48] also asserts that most useful critical thinking skills are domain specific.

Opposite to this, Halpern [52] after reviewing general instruction with the implementation of critical thinking claims that general instructions in critical thinking have valuable potential while Limpon [15] states that critical thinking facilitates good judgment either in across or within the domain. Whereas, Von [60] claims that critical thinking is general in nature. Significantly, Facione [13] has conducted the California Critical Thinking Skills Test for general assessment of critical thinking skill and found that the use of critical thinking is domain specific similarly Paul [1] notes that to learn with critical thinking skills within one's discipline requires appropriate standards and values in that discipline.

According to Ennis [10], for critical thinking, background knowledge is essential and it can be taught within a specific domain. Likewise, many researchers claim that for critical thinking background knowledge is very important and essential if students use their critical thinking skills [32, 58, 23] and McPeck [48] says that students need 'something' to think critically about that thing. Facione [13] is in the same context and asserts:

Although the identification and analysis of critical thinking skills transcend, in significant ways, specific subjects or disciplines, learning and applying these skills in many contexts requires domain-specific knowledge.

It indicates that learners must be aware of their specific context and situation in order to use their existing and previous knowledge. For doing so, students must be provided with sufficient opportunities to use critical thinking skills in a specific domain. Willingham [23] argues that students can better think within a given domain rather than in generic sense.

Willingham (23) further argues that students may exhibit critical thinking in one context but fail to use in another context. He means that students are unable to transfer critical thinking out of a specific domain. Furthermore, Bailin et al., [59] states that domain specific knowledge is inevitable for critical thinking because evaluation, explanation and evidence vary from situation to situation. Similarly, Ennis [33] argues that general instructions in critical thinking are considered successful because these are domain specific. Willingham [23] also favors domain specific knowledge.

According to McKown [61], the teaching of critical thinking skills in a specific domain leaves an impact on students' learning abilities. Grosser and Lombard [62] conducted a study on the development of critical thinking and teachers. The findings of the study showed that novice teachers teach critical thinking around the 12th grade level while the courses which were taught in a specific domain improved teachers critical thinking skills better than before.

Grauerholz and Bouma-Holtrop [63] conducted a study on the assessment of critical thinking skill in Sociology course. The findings of the study showed that students possess deep knowledge in the context and used their critical thinking skills aptly. Hatcher's [64] study found significant differences in the results when he tested students' critical thinking in a specific domain. Colucciello's [65] study revealed that through the application of domain specific instruction, students' critical thinking skills can be thoroughly assessed in a specific domain.

Lastly, the study by Schumm, Webb, Turek, Jones and Ballard [66] to assess U.S. Army's Command and General Staff College on the successful usage of critical thinking skills and reasoning found that participants of the study benefited from collaborative exercises. They also found students' diversity and domain specific application of critical thinking skills. They further stated that students performed better when

instructions are delivered for specific domain. In essence, to sum up domain specificity with Bailin [59],

It makes no sense to refer to a process of interpreting which remains constant regardless of subject matter. Rather, what is involved in and even meant by interpreting varies with the context, and this difference is connected with the different kinds of knowledge and understanding necessary for successful completion of a particular task.

Interpreting advocates of domain specificity, one can say that domain specificity aims to complete specific tasks that require critical bent of mid this is why various educators support domain specificity for the use of critical thinking skills.

Discussion and Conclusion

The purpose of this study is to throw light on the significance of critical thinking skills for domain specificity. For doing so, relevant arguments to share that what critical thinking is, its purpose in education, relationship with creativity and importance of teaching critical thinking are briefly discussed. Based on the arguments, this study concludes that improvement in critical thinking requires a bent of mind, creativity and effective teaching of critical thinking. Secondly, it is derived that as critical thinking requires many strategies then these strategies can only be applied in a specific domain. Majority of the studies found that students perform better in a given specific domain and produce improved results.

Particularly, the author concludes that the use of critical thinking skill has the capacity to make learning more natural, objective and enjoyable when used for specific purposes and in a specific domain either in classrooms, at work place or in any other formal or informal situation.

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