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Importance of Incorporating Critical Thinking in Undergraduate Learning Environments

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1. Introduction

CT is a self-guided, self-disciplined thinking which attempts to reason at the highest level of quality in a fair-minded way (Elder, 2007).

According to Glaser (1941) CT is a skill that requires people to

- examine a belief or supposed form of knowledge in the light of the evidence
- recognize problems and to find workable means for solving those problems
- recognize unstated assumptions and values
- comprehend and use language with accuracy, clarity, and discrimination.

Both Elder and Glaser's explanations focus on the 'self development' and 'self management' by thinking critically. Today's work environments seek to hire people who can think independently and make effective decisions. It leads to the need for empowering the learners with CT skills as much as one can so that they become 'employable'.

The idea of CT traces back to the times of Socrates "who discovered by a method of probing questioning that people could not rationally justify their confident claims to knowledge" 2,500 years ago (Paul, Elder & Bartell, 1997). In today's era where there is scarcity of jobs and the graduates in almost all the countries are motivated to turn themselves toward 'start-ups', the same ability referred by Socrates becomes the most important asset.

CT leads to considering and articulating assumptions in problem solving, selecting appropriate hypotheses and methods for experiments and structuring open-ended design problems. Graduates including the engineering and technology students need strong CT skills to deal with a world of increasingly rapid change and complexity (Lombard, 2004). When it

comes to science graduates, CT enables the students to conduct experiments with a new perspective (Bruno & Anderson, 2005; Miller & Olds, 1994).

According to Bissell & Lemons (2006) it is very important to help students develop higher-order thinking skills and divert them to a more fruitful learning experience by doing something more sophisticated than memorization of lectures or textbooks where the analysis is not required. With this it is important to mention here the initiatives of American Association for the Advancement of Science (1989) and National Academy of Sciences (2003) for the inclusion of CT in the curriculum.

2. Teaching Critical Thinking

After justifying the need and demand for CT, the question that comes up is: *Can we teach our students to think?*

Some CT researchers have stated that critical thinking and abilities can be taught. Halpern (1998) has presented evidence improving the CT skills and abilities of college students. Kennedy et al. (1991) have advocated instructional interventions for improving students' CT skills. Abrami et al. (2008) found positive impact of instructional interventions on students' CT skills.

It leads the educators in a positive direction where there is a possibility of producing the students who can think in an independent manner and not just the ones who remember and reproduce knowledge and information for achieving good grades.

As it comes to the appropriate approach for teaching CT, the following approaches have emerged.

General Approach

This approach favors direct and explicit instruction in CT skills as a separate course. In this approach, CT skills and abilities are emphasized outside the context of specific subject matter. The content devised and delivered under this approach is not related to discipline-specific knowledge of the students. But it deals with the problems that the students might face while studying their subjects. According to Gelder (2005) this approach provides the students with 'deliberate practice' in exercising CT skills and abilities. He has also stated the

importance of teaching students on how to transfer CT to a variety of contexts. This can be done by providing them with opportunities to apply CT skills in diverse contexts. Halpern (2001) has opined that instruction in general thinking skills is the most effective way of teaching CT.

Infusion Approach

This approach advocates in-depth instruction in the subject matter along with instructions on general critical thinking principles. It means the CT instructions should be provided in the context of the subject taught. According to Ennis (1989), this is an 'across the curriculum' approach. Here, as the CT is treated as a part of the subjects taught to the students, it becomes easy for the teachers to deal with both the subject matter and the CT elements. This integration enables the students to acquire the CT skills in a natural manner.

Lipman (1988) has opined that instruction in CT should go hand-in-hand with instruction in basic skills, such as reading, writing, listening, and speaking. Silva (2008) has also supported Lipman by expressing the need for maintaining that knowledge and thinking.

Mixed Approach

This approach combines elements of both the general and subject-specific approaches. It supports the idea of offering CT instruction by integrating it into regular academic content and by teaching general CT skills as a stand-alone component.

3. Instructional Strategies for Teaching Critical Thinking

Number of research works in the domain of CT has recommended different instructional strategies to develop students' CT skills. Some of the popular techniques are explicit instruction, collaborative or cooperative learning, modeling, and constructivist techniques.

According to Case (2005), Facione (1990), Halpern (1998) and Paul (1992) CT skills and abilities are unlikely to develop in the absence of *explicit instruction*.

On the other hand Bonk & Smith (1998), Heyman (2008), Nelson (1994) and Thayer-Bacon (2000) have recommended *collaborative or cooperative approach* for infusing the CT skills among students. Supporting the collaborative approach Thayer-Bacon (2000) has emphasized

the importance of students' relationships with others in developing CT skills. Bailin et al. (1999) have placed emphasis on group discussions for developing CT by stating the reasons such as the cultivation of abilities to respond constructively to others and respecting the contributions.

Bonk & Smith (1998) and Paul (1992) have advocated the use of *constructivist learning* methods where student -centered activities can be carried out. Here the students should be put in a situation where they are supposed to think independently and come out with solutions to the existing/specified problems.

4. Ways to Incorporate Critical Thinking Skills

After stating the importance of integrating CT instruction in the educational settings, here are some ways teachers can incorporate the CT in classroom situations.

- According to Nelson (1994) students can be put in collaborative learning situations to enhance their CT skills by providing them with a common background on which to collaborate, such as common assigned readings.
- Reading tasks based on the areas of their interest, motivates the students to dig out for new ideas and knowledge. Post-reading presentations and discussions can be a fruitful way to develop the CT skills.
- Providing the student groups with sophisticated questions and analytical frameworks can help them think in line of the activities leading them to evaluation and analysis.
- Collaborative activities where students are entitled to different incentives for active participation in various group tasks can help them enhance their CT skills with intense interest.
- Bonk and Smith (1998) have suggested activities like think-pair-share, round-robin discussions, student interviews, roundtables, gallery walks, and “jigsawing” that have potential for collaboration to enhance CT learning.
- Inclusion of activities where students are made to analyze and present graphs, charts, tables in the educational settings can help develop their CT skills.
- Also making them to share their opinions on recent happenings and events in various domains enables them to view things in a critical manner where they need to weigh on

various options and possibilities before presenting their opinions. This kind of tasks can also play a pivotal role in enhancing the CT skills of the students.

5. Conclusion and Recommendations

Finally, the importance of CT skills and independent thinking abilities is something that makes an individual different from the masses. It is very important to provide the students with opportunities in which they can put their thinking skills at practice and help themselves come out with new possibilities and solutions to the existing problems. As stated earlier, in either manner, by offering a separate training on CT skills or by integrating it in the regular curriculum, students are going to a great benefit as they would be able to visualize and realize what they are studying and what would be their role in making this world a better place to live.

I would like to conclude this paper with the following recommendations.

- Educational institutes and the teachers should engage themselves in devising the methodology to include CT treatment in the day to day dealings with the students.
- The teachers should motivate the students to read more and by doing that we would be able to make them move beyond the four walls of the classrooms which would provide them an opportunity to feel what is there beyond the curriculum. This can ignite their will to think and act in a direction of their interest.
- One should also try to teach in a way so that students could grasp more and in that way they would also be able to express more.
- Students should be allowed to speak and interact more so that they get the opportunity and challenge to communicate with their peers.
- Students should be involved rigorously in activities like reading, writings, speaking and listening. After all this makes a common set of skills possessed by everyone, those who have been successful and the ones who haven't.

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