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A Survey on Critical Thinking in Education Scenario

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Abstract— Critical thinking has been a controversial issue among philosophers, researchers and educationalists, although there is no general consensus on a definition. Everyone thinks; it is our nature to do so. But much of our thinking, left to it-self, is biased, distorted, partial, uninformed or down-right prejudiced. Yet the quality of our life and that of what we produce, make, or build depends precisely on the quality of our thought. Excellence in thought, however, must be systematically cultivated. Critical thinking is that mode of thinking - about any subject, content, or problem - in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them. Critical thinking is not a matter of accumulating information. A person with a good memory and who knows a lot of facts is not necessarily good at critical thinking. A critical thinker is able to deduce consequences from what he/she knows, and he/she knows how to make use of information to solve problems, and to seek relevant sources of information to inform himself / herself. Critical thinking should not be confused with being argumentative or being critical of other people. Although critical thinking skills can be used in exposing fallacies and bad reasoning, critical thinking can also play an important role in cooperative reasoning and constructive tasks. Critical thinking can help us acquire knowledge, improve our theories, and strengthen arguments. It is self-guided, self-disciplined thinking which attempts to reason at the highest level of quality in a fair-minded way.

Keywords- CT, behavior, LT, sociocentrism, assumptions, information

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I. INTRODUCTION

Critical thinking is 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. Critical thinking can be seen as having two components:

1) A set of information and belief generating and processing skills, and

2) The habit, based on intellectual commitment, of using those skills to guide behavior.

Someone with critical thinking skills is able to do the following:

- understand the logical connections between ideas
- identify, construct and evaluate arguments
- detect inconsistencies and common mistakes in reasoning
- solve problems systematically
- identify the relevance and importance of ideas
- reflect on the justification of one's own beliefs and values.

Critical thinking can help us acquire knowledge, improve our theories, and strengthen arguments. Critical thinking of any kind is never universal in any individual; everyone is subject to episodes of undisciplined or irrational thought. Its quality is therefore typically a matter of degree and dependent on, among other things, the quality and depth of experience in a given domain of thinking or with respect to a particular class of questions. The development of critical thinking skills and dispositions is a life-long endeavor. People who think critically consistently attempt to live rationally, reasonably, empathically. They are keenly aware of the inherently flawed nature of human thinking when left unchecked. They use the intellectual tools that critical thinking offers – concepts and principles that enable them to analyze, assess, and improve thinking. They work diligently to develop the intellectual virtues of intellectual integrity, intellectual humility, intellectual civility, intellectual empathy, intellectual sense of justice and confidence in reason. They realize that no matter how skilled they are as thinkers, they can always improve their reasoning abilities and they will at times fall prey to mistakes in reasoning, human irrationality, prejudices, biases, distortions, uncritically accepted social rules and taboos, self-interest, and vested interest. They strive to improve the world in whatever ways they can and contribute to a more rational, civilized society. At the same time, they recognize the complexities often inherent in doing so. They avoid thinking simplistically about complicated issues and strive to appropriately consider the rights and needs of relevant others. They recognize the complexities in developing as thinkers, and commit themselves to life-long practice toward self-improvement. A well cultivated critical thinker:

- Raises vital questions and problems, formulating them clearly and precisely;
- Gathers and assesses relevant information, using abstract ideas to interpret it effectively comes to

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well-reasoned Conclusions and solutions, testing them against relevant criteria and standards;

- Thinks open mindedly within alternative systems of thought, recognizing and assessing, as need be, their assumptions, implications, and practical consequences;

- Communicates effectively with others in figuring out solutions to complex problems.

Critical thinking is, in short, self-directed, self-disciplined, self-monitored, and self-corrective thinking. It presupposes assent to rigorous standards of excellence and mindful command of their use. It entails effective communication and problem solving abilities and a commitment to overcome our native egocentrism and sociocentrism. We can use critical thinking to enhance work processes and improve social institutions.

II.　THE IMPORTANCE OF CRITICAL THINKING

Critical Thinking is a meta-thinking skill. It requires careful reflection on the good principles of reasoning, making a conscious effort to internalize them and applying them in daily life.

1. Critical thinking is a domain-general thinking skill: The ability to think clearly and rationally is important whatever we choose to do. If work in education, research, finance, management or the legal profession, then critical thinking is obviously important. But critical thinking skills are not restricted to a particular subject area. Being able to think well and solve problems systematically is an asset for any career.

2. Critical thinking is very important in the new knowledge economy: The global knowledge economy is driven by information and technology. One has to be able to deal with changes quickly and effectively. The new economy places increasing demands on flexible intellectual skills, and the ability to analyze information and integrate diverse sources of knowledge in solving problems. Good critical thinking promotes such thinking skills, and is very important in the fast-changing workplace.

3. Critical thinking enhances language and presentation skills: Thinking clearly and systematically can improve the way we express our ideas. In learning how to analyze the logical structure of texts, critical thinking also improves comprehension abilities.

4. Critical thinking promotes creativity: To come up with a creative solution to a problem involves not just having new ideas. It must also be the case that the new ideas being generated are useful and relevant to the task at hand. Critical thinking plays a crucial role in evaluating new ideas, selecting the best ones and modifying them if necessary

5. Critical thinking is crucial for self-reflection: In order to live a meaningful life and to structure our lives accordingly, we need to justify and reflect on our values and decisions. Critical thinking provides the tools for this process of self-evaluation.

6. Good critical thinking is the foundation of science and democracy: Science requires the critical use of reason in experimentation and theory confirmation. The proper functioning of a liberal democracy requires citizens who can think critically about social issues to inform their judgments about proper governance and to overcome biases and prejudice.

This prime intellectual and practical skill seems to be something that majority of students coming into higher education and the workforce are not only lacking in application, but also in concept. Often, Critical Thinking has been overlooked at the elementary, middle, and high school levels where the primary focus is on rote learning of concepts rather than skillful application of ideas. When these students make it to the level of higher education or the corporate workforce, the educators/trainers are compelled to begin by teaching the basics of Critical Thinking as opposed to sharing complex information that need analysis. Learning requires effort, but Critical Thinking requires maximum exertion of intellectual capacity. Hence, much of the Critical Thinking concept remains not only to be taught but; most importantly, to be aptly utilized in our day-to-day lives. There are a few reasons to introduce Critical Thinking in Higher Education-Campus Curriculum:

i.　Logical Thinking and Problem Solving is an asset across careers: Critical Thinking is a domain-agnostic skill. Irrespective of whether one chooses to work in the field of education, research, finance, management or a legal profession, Critical Thinking is indispensable. Critical Thinking is not isolated but a seminal goal, the hub around which all other educational fields converge. As students learn to think more critically, they become more proficient at historical, scientific, and mathematical thinking. They develop skills, abilities and values critical for success in everyday life.

ii.　It is what is required in today's times – Today in the internet era, access to reading material is not a privilege of those few enrolled in select institutions. Hence it is the disposition to enquiry and ability to think critically that is the real requirement of the current times.

iii.　CT enhances language and presentation skills: Thinking in a structured manner can improve the way in which we express our ideas. In learning how to analyze the logical

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structure of texts, Critical Thinking improves comprehension abilities. It is the soul of effective communication.

iv.   Critical Thinking also promotes creativity: Creative problem-solving mandates the generation of feasible and relevant ideas. Critical Thinking plays a crucial role in evaluating new ideas, selecting the best ones and improvising on them, as required. Creativity and Critical thinking go hand-in-hand.

It's not 'what' to think rather 'how' to think. It includes the ability to engage in independent, reflective thinking. A critical thinker should be able to do the following with ease:

a.   Identify the relevance and importance of ideas
b.   Understand the logical connections and establish linkages between ideas
c.   Identify, construct and evaluate arguments
d.   Detect inconsistencies and common mistakes (fallacies) in reasoning
e.   Solve problems systematically
f.   Reflect on the accuracy of one's own beliefs and values

A Critical Thinker is NOT neither an information hoarder who knows how to utilize information wisely to solve problems nor Critical of others. Although Critical Thinking skills can be used in exposing fallacies/bad reasoning, it facilitates cooperative and constructive reasoning.

III.   BENEFITS OF IMPROVING CRITICAL THINKING ABILITY

Critical Thinking Ability forms a very important part of our aptitude. There are many skills that are required for a student to develop into an efficient individual. For many competitive exams, these skills are used to find out the best candidates. Proficiency in written and verbal communication in languages, general knowledge, interpretation of data, logical ability and critical thinking skills. These play vital role in securing seats in various government exams for jobs and for acquiring seats in colleges by entrance exams. These exams usually check the aptitude of the applicant. There are some benefits of improving critical thinking ability:

i.   Become independent
ii.   Think creatively
iii.   Develop opinions
iv.   Increase self-awareness
v.   Understand others
vi.   Increase decision making ability

IV.   ANALYSIS OF CRITICAL THINKING

Analysis is breaking down the text or problem that we are examining in order to understand each individual part. Analysis is like taking an already completed puzzle apart OR breaking owns a chemical compound to look at individual components that make up that compound. The goal is to look at the individual pieces that make up the whole.

There are two essential dimensions of thinking that students need to master in order to develop as fair-minded critical thinkers. They need to be able to identify the "parts" of thinking, and they need to be able to assess use of these parts of thinking, as follows:

•   All reasoning has a purpose

-   Take time to state purpose clearly

-   Distinguish purpose from related purposes

-   Check periodically to be sure we are still on target

-   Choose significant and realistic purposes

•   All reasoning is an attempt to figure something out, to settle some question, to solve some problem

-   Take time to clearly and precisely state the question at issue

-   Express the question in several ways to clarify its meaning and scope

-   Break the question into sub questions

-   Identify if the question has one right answer, is a matter of opinion, or requires reasoning from more than one point of view

•   All reasoning is based on assumptions

-   Clearly identify our assumptions and determine whether they are justifiable

-   Consider how our assumptions are shaping our point of view

•   All reasoning is done from some point of view

-Identify our point of view

-   Seek other points of view and identify their strengths as well as weaknesses

-Strive to be fair-minded in evaluating all points of view

•   All reasoning is based on data, information, and evidence

-   Restrict our claims to those supported by the data we have

-   Search for information that opposes our position as well as information that   supports it

-   Make sure that all information used is clear, accurate, and relevant to the   question at issue

-   Make sure we have gathered sufficient information

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- All reasoning is expressed through, and shaped by, concepts and ideas

  - -Identify key concepts and explain them clearly

  - Consider alternative concepts or alternative definitions to concepts

  - Make sure we are using concepts with care and precision

- All reasoning contains inferences or interpretations by which we draw conclusions and give meaning to data

  - -Infer only what the evidence implies

  - Check inferences for their consistency with each other

  - Identify assumptions which lead us to our inferences

- All reasoning leads somewhere, has implications and consequences

  - Trace the implications and consequences that follow from our reasoning

  - Search for negative as well as positive implications

  - Consider all possible consequences

There are many standards appropriate to the assessment of thinking as it might occur in this or that context, but some standards are virtually universal which is applicable to all thinking such as clarity, precision, accuracy, relevance, depth, breadth, and logic.

Critical thinking calls for a persistent effort to examine any belief or any form of knowledge in the light of the evidence that support it.

V. REVIEW OF LITERATURE

Caproni et al. (1994) outlined the means and benefits of using critical thinking in the training of managerial skills, offering a model and suggestions for the rehashing of the present managerial training. Author gave an idea for the training of managerial skills to mean the development or enhancement of an individual's management skills, which includes interpersonal communication as well as conflict resolution, goal setting, and power management.

Kuhn et al. (2003) found striking differences across cultural groups and sub-cultural groups within india in the responses of parents and children to several questions like this one: Many social issues, like the death penalty, gun control, or medical care, are pretty much matters of personal opinion, and there is no basis for saying that one person's opinion is any better than

another's. The intellectual endeavors that college students undertake must reveal their intrinsic value in a way that is accessible to the student and can be embraced as worth the effort entailed. It is a criterion that those of us who teach college students would do well to keep in mind as we plan our course outlines.

Lall et al. (2005) placed the current issues facing education in India in a historical context. It became clear that the same difficulties that existed nearly sixty years ago remain largely unsolved today – for example, the need to safeguard access to education for the poorest era of India.

Andrade et al. (2007) explored the possibilities in reinventing critical pedagogy in the context of Indian formal education, and to examine the tensions and limitations that emerge and that would need to be addressed in such an attempt. He stated the points of commonality and difference between the worldviews framing the Indian culture of pedagogy and critical pedagogy. Based on the specific historical, social, cultural and political context in which each of these pedagogies arose, the thesis will explore how the points of commonality between these two frameworks can allow them to speak to each other, and how the differences between them can be potentially reconciled.

Turuk Kuek et al. (2010) found that students' critical thinking, reasoning and argumentative writing skills improved dramatically. In addition, there were improvements in their perceptions and attitudes towards thinking skills as well as in their understanding of the cognitive relationship between reading and writing. Moreover, a remarkable improvement in their spoken English was recorded as well as they developed positive attitudes towards learning English.

Iyengar et al. (2010) highlighted institutional differences that affect policy implementation in two mega cities of India, namely, Mumbai and Delhi. He suggested that policy reshaping rarely considers the feedback from the bottom up; rather, policies are revised largely based on global and national agenda shifts rather than in response to on-the-ground impact of their implementation.

Chakrabarty et al. (2011) stated that education is vital to the human resources development and empowerment in the stages of growth of a nation. In any education system, higher education encompassing Management, Engineering, Medicines etc., plays a major role in imparting knowledge, values, and developing skills and, in the process, increase the growth and productivity of the nation.

Bhatia et al. (2011) stated need of value based higher education system which empowers youth for self sustainability by inculcating employment skills and hence reducing poverty. India's higher education system is the third largest in the world. It included the comparative study of components of value

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based higher education system of six countries - UK, China, USA, Australia, Brazil and South Africa with India. The paper proposed educational reforms and explains the critical aspects of managing, and delivering superior value of the higher education system in India. This study described a complete view of the need of value in higher education system in India.

Gakhar et al. (2012) throw light on the education system of Haryana, with a comparative eye on its neighboring states. An analysis of the educational achievements of these states from different angles will help the experts and the researchers to know how far we have gone in achieving our targets and what needs to be done. Along with this, a comparison of the literacy rates and literates of these states has also been made. This paper was based on the data collected from different websites of ministry as well as reports of planning commission.

Kalia et al. (2012) described about continuous and comprehensive evaluation whose objective was continuous holistic development of students with focus on skill learning by adding job-oriented and job-linked inputs. CCE treats assessment as a form of communication and as an integral part of learning and teaching. According to this, the overall goal of assessment should be to improve student learning and be able to provide a detailed interpretation of learner's profile dynamics. It values both process and the product.

Pujara et al. (2013) founded some challenges and some fundamental problems of Indian education system like: Lack of Infrastructure Facilities, Student-Teacher Ratio, Indian Education Thrives on Rat Race, Indian Education and the Personality Development, Quality of Education, Growth of Parochialism and Fundamentalism in Education, Recruitment of Inefficient and Untrained Teachers, Increasing Drop out Ratio in organizations, Lack of Creation and Innovation, Mass Copying and Deterioration of Values, Mushrooms of the Private Universities and Degradation of the Standard of Education. To sum up, we need to recognize that the knowledge, skills and productivity of our growing young and dynamic work force forms the backbone of our economy. According to him, the emphasis should be on quality of education in terms of infrastructure, teachers, accreditation, etc. and affordability of education ensuring poor and deserving students are not denied education.

Ghadi et al. (2014) showed process to evaluate the psychological properties of the construct validity for Critical Thinking Skills (CTS) test. The CTS test consists of multiple-choice questions measuring seven dispositions namely, analysis, evaluation, deduction and induction. CTS test had satisfactory construct validity (convergent and divergent) with four factors extracted and confirmed by exploratory factor analyses. The result shows significant correlations between CTS sub domains.

Goswami et al. (2014) stated role of technology in Indian educational system. According to him, there is an emerging broad consensus around the world about the benefits that can be brought to education system through the appropriate use of evolving information and communication technologies. The range of possible benefits pervaded practically all areas of activity in which knowledge and communication play a vital role.

Khandka et al. (2015) found 4 Reasons to introduce Critical Thinking in Higher Education like logical thinking and problem solving, language and presentation skill, creativity. According to author, Good critical thinking might be seen as the foundation of science and a liberal democratic society. Science requires the critical use of reason in experimentation and theory validation.

Sharma et al. (2015) Higher education system played an important role for the country's overall development which includes industrial, social, economic etc. Indian higher education system is third largest in the world. The role of Indian higher educational institutes such as colleges and universities in the present time is to provide quality based education in the field of education, research etc to empower youth for self sustainability. This paper included the key challenges that India is currently facing in higher education and also includes some initiatives taken by the government to meet those challenges.

Mukherjee et al. (2015) stated the changes in indian educational system. He focused on skill based education like Reward creativity, original thinking, research and innovation etc. According to him, India needs to embrace internet and technology if it has to teach all of its huge population, the majority of which is located in remote villages. Overall he Re-define the purpose of the education system.

Mehta et al. (2015) explained Critical Pedagogy for The Future in Indian Education where a crucial problem is that there is an imbalance at all levels of inter-personal relationships in education which is undesirable. In other words, democratic education that fosters critical thinking needs to be promoted to overcome the power imbalance existing at all levels of inter-personal relations in education. In this paper he discussed the relevance of critical pedagogy which is the need of the hour advanced pedagogy for the future to promote a culture of critical thinking amongst students for social transformation and democracy in Indian education.

Bhuyan et al. (2016) stated that Education is the most efficient instrument which can enrich the people with the knowledge, skill, capacity and confidence for building a dynamic, vibrant nation that takes care of its entire people. Higher education occupies a place of special importance

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because it can provide ideas and personnel to give shape to the future.

Borgohain et al. (2016) stated a critical analysis report on commercialization of educational system. In this report he said the development of any nations depends mainly on the standards of its educational system. Education is the most powerful and effective instrument for including radical changes in the behavior of students. It is a powerful instrument of nation's social economic and cultural development. There reforms envisage the withdrawal of state from its social obligations once for all. Thus, each country should decide that can be constructively introduced in their socio-economic and educational system.

Sherafat et al. (2016) provide us a comparative study of government and private school students on their critical thinking and study habits. Results indicated that Government and Private colleges / schools students differ on their critical thinking and study habits. Those students who were on Private colleges / schools had better critical thinking ability and study habits in favour of Government colleges / school students. It means, the critical thinking abilities and Study Habits of private colleges / school students are better than government colleges / school students.

Khan et al. (2017) told the development and implementation of planned new approaches to teaching and learning offered an opportunity to explore critical thinking at policy, course development and implementation levels. The central feature is the skill and willingness to ask productive questions. Using the working definition as a point of reference, this study explored how undergraduate students and teachers perceived the nature of critical thinking as a concept as well as the set of skills that exemplify critical thinking. Another theme that was explored was how the course guidelines were being followed in the context of the development of critical thinking.

VI. CONCLUSION

This study examined the likely facilitators and barriers in the development of critical thinking as perceived by students and teachers involved in the course. To analyze critical thinking in Education scenario in India here are three approaches:

Approach1: General approach - Critical thinking being taught separately from subject area content. On the other hand, critical thinking is infused into subject area content. Subject area curriculum has explicit objectives in the area of critical thinking, alongside the subject area objectives. Where as in immersion approach, there should be deep mental involvement into subject area or objectives.

Approach2: Mixed approach - A combination of a general approach and either infusion or immersion. Students

receive instruction in critical thinking in the context of subject matter, with a separate course aimed at teaching general principles of critical thinking.

Approach3: Non-conventional approach –

• Students' feedback from the students based on attendance.

• Beyond the syllabus activity where students get an opportunity to explore their skills in interdisciplinary areas along with hands on experiments.

The assignments should be based on research ideas and related to the subject of interest of the students. By virtue of this, students can generate innovative ideas that will help in their future research work. This approach has to be implemented in a software module.

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