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Responses to Audience Questions

As a part of the webinar "Enhancing Classroom Effectiveness by Facilitating Thinking"

Organized in partnership with
FACE** and **Tamil Nadu Teachers Education University

Dear participants of the webinar on Enhancing Classroom Effectiveness by Facilitating Thinking,

The culture of mainstream formal education as it exists today in India (and many other parts of the world) shows four core preoccupations:

- Employability
- Degrees and certificates
- Exams and tests
- Covering the syllabus

Employability means having the skills that are necessary to get jobs that pay a salary, and jobs that pay higher salaries. This educational culture exists in a broader culture in which a person's worth is measured in term of his/her income. Until recently, the teaching profession was revered as a noble profession because we help the young grow into adults who contribute to the well-being of the world and the nation. But as a result of the culture of money, our profession has become the lowest in the rung, and students whose parents have three times the salary that teachers have look down on their teachers.

Employability in the education system, is translated as **getting certificates and degrees** which have high market value in terms of salary. This is what people mean when they ask about the 'scope' of a degree program. Thus, a degree in accountancy is ranked high and a degree in mathematics is ranked low, because of the difference between the salaries of accountants and mathematicians. Engineering is perceived as of having higher 'scope' than science for the same reason. The same way, a degree from IIT is perceived as having higher market value than a degree from Delhi university. The value of what a student ***learns*** in these programs becomes irrelevant in this culture of degrees and certificates.

To be admitted to an educational program of higher education that promises to yield a degree/certificate which has a higher probability of higher income, a student has to compete for higher scores in **exams and tests**. As a result, learning what is valuable to a student after graduation has been replaced by the process of learning how to score high marks in exams and tests, resulting in the mushrooming of coaching classes that do precisely that.

Unlike the coachers in the coaching classes, school teachers tend to think that **'covering the syllabus'** is necessary and sufficient for helping learners to do well in exams and tests. Hence, in the anxiety to 'cover the portions', there is a hesitation to invest time on anything that goes beyond the prescribed syllabus and textbooks.

This webinar was an invitation to go beyond the above educational culture of employability, degrees and certificates, where students are trained to get high scores in exams and tests, and teachers are focused on covering the portions. It is an attempt to bring out the need to go beyond memorisation, regurgitation of information without understanding, and mechanical skills performed at high speed without thinking, to what NCF 2005 calls *constructivism* which assigns high value to the ability to construct and evaluate knowledge, and what NEP 2019 calls the capacity for *Higher Order Cognition*.

One of the strands of ***Higher Order Cognition*** is Thinking. And two of the important strands of thinking are Critical Thinking and Inquiry that goes into the ***construction of academic knowledge*** (mathematics, physical and biological sciences, the human/social sciences, and the humanities. We spoke about the importance of this switch, illustrated it with three classroom activities, and spelt out five "best practices" that are needed in the classroom to achieve the educational goal of developing thinking abilities, especially the ability to engage in inquiry and critical thinking.

You can help children develop the abilities of inquiry and critical thinking using the learning tasks in the learning materials already available at the internet. There are many such at the ThinQ website: www.thinq.education But if you wish to modify these learning tasks or design your own tasks, you need to become a reasonably proficient inquirer and critical thinker yourself. One way to do that is to join ThinQ's online course on Inquiry and Integration in Education (http://www.thinq.education/iie).

We give below our responses to some of the questions you raised in the webinar. Because of the limitations of time, we have limited our responses to those questions that are directly relevant to our theme of developing thinking abilities, and questions that are of interest to a wider population of teachers. We have also left out questions whose meaning is unclear. We apologise for not being able to address all your questions.

Q-1: We already use ppts, models and charts. For Science subjects, are there other means to make the class even more lively? [Ganesan Vivekanandan]

A-1: There is a huge difference between

(a) helping learners to learn what is of value to them in their life AFTER they have completed the educational programs, in a way that such learning is ***interesting and enjoyable,*** and

(b) making the class ***fun or lively by entertaining*** the learners.

Making the class interesting and enjoyable is a means to the achieve the goal of helping learners learn what is of value to them. Merely doing (b) may not contribute to that goal. You can entertain learners by cracking jokes or showing funny videos, but what would they learn?

It has been our experience that the use of power points does not contribute to valuable learning. If your goal is learning, we would recommend that you learn how to use green/white boards in an effective manner. Charts are occasionally useful, but charts by themselves do not ensure valuable learning.

If you want to learn how to get students to think in the classroom, take a look at the videos in the playlist of the Rational Inquiry Workshop for ninth graders where you can find more examples of exercises, and also observe the classroom practices that facilitate thinking (at https://www.youtube.com/watch?v=NfkQI4LZekM&list=PLyg1zG7Gd9VA8Cu54kllfqgpWNYHCv273)

Q-2: (rephrased) In the classroom, how do we use equations and formulae in math and science, or mathematical ideas like differentiation, integration, and scientific conclusions in daily life? [Revathy Ramadass]

A-2: Equations and formulae are to be memorised and applied in making calculations. If you wish to helping learners to acquire the ability to ***think***, you should go beyond mere equations and formulae and making high speed calculations, to engage with ideas, clarify concepts (demonstrated by the example 'what is a straight line?'), to arrive at conclusions through careful reasoning (demonstrated by the example 'who is an enemy?'), to justify conclusions, and to evaluate them (demonstrated by the example of the earth and the sun).

Q-3: What are factors involved in a Good classroom effectiveness? [Vellaisamy P]

A-3: Effectiveness depends on what our educational goal is. Effective strategies for memorizing information and making high speed calculation (what is done in coaching centers) are not necessarily good strategies for helping them learn to think. To get a sense of some of the effective strategies for critical thinking and inquiry, look at the interactive strategies illustrated in the videos mentioned in our response to question 2.

Q-4: Most of the students asking me that, we are not using most of the topics like linear equations in real life, then why we are studying those kind of topics?? [Angel T]

A-4: Your students are right in questioning the value of what mainstream education forces them to learn. Developing the abilities of thinking critically, reading a piece of writing with critical engagement, engaging in reasoning, communicating ideas clearly and precisely, working in a team collaboratively to achieve a shared goal, and so on are valuable in a students' personal, professional and public lives after graduation. The core aspects of thinking in mathematics, natural sciences, social sciences, and the humanities are transferrable from these academic domains to the situations that we face in our personal-professional-public lives. But if the skills of finding the LCM or HCF of some numbers, and of solving simultaneous equations are not transferrable, if their usefulness is restricted to doing well in exams, why should the designers of education force students to learn these skills or memorise the formulae and equations?

Q-5: In most school application and skill part are given less importance, how will you enrich these aspects in reality? [Varsha Jayaprakash]

A-5: See the responses to question 4.

Q-6: In India we are giving important to knowledge part rather application part. In teaching science teacher giving important to theory rather practical [Revathy Ramasdass]

A-6: The term 'theory' and 'practical' in your question can be interpreted as "What happens in theory classes" (=the teacher lecturing to students, and the students listening) and "What happens in practical classes" (= the students doing something with their hands, following the instructions given by the teacher or textbook.) Thus, if the teacher summarises what a textbook says about the Mauryan period in Indian history, or about insects, it comes under 'theory' and if the teacher instructs students how to use Vernier callipers to measure length or transfers the liquid in a flask to a test tube using pipette, it comes under 'practical'. Neither of these activities by themselves develop thinking abilities. And what a student learns through these activities need not necessarily be transferrable such that they are of value to their lives after graduation (See the answer to question 4)

What is important is the distinction between activities that develop thinking abilities and activities that can be performed mechanically, without thinking (i.e., recalling information and skills acquired through mere training such as measuring accurately with pipettes).

Q-7: Each child is unique. based on innate traits children's understanding skill varies. how can we reach every child in the same time in the classroom [Raja Lakshmi]

A-7: Learning is a process that takes place in the mind of a learner. A teacher can provide the opportunity to learn by providing activities, if performed in the mind, can result in learning, but no teacher can guarantee that it happens in the mind of every child. All that a teacher can do is maximise the probability of learning taking place in the learners' minds.

To maximise that probability, we should attract learners to learning (instead of forcing them to learn what WE want them to learn) by making learning enjoyable (instead of making it boring and painful). Human children have a natural enjoyment of thinking. Most children also love working with others. If we shift our focus from teaching students to

> score marks in exams and tests, memorise information given in books, and perform mechanical tasks

to

> thinking and understanding, and learning what THEY want to learn

we can maximise the probability of most students learning something valuable.

Q-8: What type of qns in class room will improve thinking skills? [Maha Deva]

A-8: The kinds of questions we illustrated in the webinar (questions on explaining the yearly cycle of shadows under the sun, questions about who an 'enemy' is, questions on straight lines) are examples of questions that develop thinking abilities. For other examples, please visit the ThinQ website (www.thinq.education) and ThinQ's YouTube channel (www.youtube.com/ThinQ_ed) which has a wealth of videos and pdf files that illustrate activities that develop thinking abilities.

Q-9: In physics, how do we take derivations in a better way to children, especially in Higher Secondary level? [Sudha S]

A-9: Teaching them the mechanical skills of symbol manipulation in derivations may not be the best way of helping children acquire thinking abilties. This is necessary for scoring marks in exams, but may not be of any value after they complete their formal education. See the answer to question 4.

Q-10: What is the main objective of this class, [J. Josephine Amala]

A-10: We take it that when you say 'this class', you mean 'this webinar' on Enhancing Classroom Effectiveness by Facilitating Thinking.' Well, the main objective of this webinar is to sensitise you to what it means to think, and the need to help students develop thinking abilities through classroom activities and practices that nurture thinking abilities.

Q-11: Ethics is essential to everyone. As teachers, how can we create student philosophers as great thinkers....[Jayanthi Susaimuthu]

A-11: There is a small number of philosophers who have devoted their lives to developing philosophical thinking abilities in very young children, from age 5 and above. They call this program "Philosophy for Children" This includes ethical inquiry as well. (Our example of thinking though "Should we kill our enemies?" was an example of ethical inquiry.

If you do a search for "philosophy for children" on YouTube, you will get many videos that illustrate the philosophy for children activities in the classroom. e.g.,

1) "Sara Goering - Philosophy for Kids: Sparking a Love of Learning" at https://www.youtube.com/watchv=7DLzXAjscXk&t=1s

2) "Philosophy for Children " at https://www.youtube.com/watch?v=tk_B32HtnWg

(This is just a very small sample.)

You can also see lots of video and text material at the Philosophy Foundation (https://www.philosophy-foundation.org)