

Strategies for Strengthening Thinking Skills

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ABSTRACT

Skill is a foundational element for the development of the nation. It is an ability to perform a task in competent manner or it is an ability to perform a task leading to a specific pre-determined outcome. Thinking skills refer to the abilities for adaptive and positive behaviours that enable individuals to deal with the demands and challenges of everyday life. It focuses on behaviour change or behaviour development approach designed to address a balance of three elements viz., a) Knowledge, b) attitude and c) competency. Presently, thinking skills are being reflected with 21st century skills which can be visualized in 4Cs i.e., 1) Critical thinking and problem-solving skills, 2) Creative thinking and innovation, 3) Communication skills and 4) Collaboration skills. There are three core strategies for developing thinking skills. They are: 1) Questioning strategies, 2) Problem solving strategies and 3) Idea generation strategies. This paper deals with strategies for strengthening these skills.

KEYWORDS: Skill, 21st Century Skills and Strategy

INTRODUCTION

The prosperity and progress of the nation economically, culturally, socially, morally and globally depends on three important long-term goals viz., i) To bring about an equitable and vibrant knowledge society by providing quality education to all. ii) To develop sense of respect towards fundamental rights, duties and constitutional values and a conscious awareness of one's roles and responsibilities towards changing world. iii) To instill skills, values and dispositions that support responsible commitment to human rights, sustainable development and living & global wellbeing (NEP, 2020). Conceptual understanding, critical thinking, identification of unique capabilities, respect for diversity and local context in all curriculum, pedagogy and policy, equity and inclusion and community participation and continuous review are the key principles of holistic development. For perceiving the key principles pragmatically and for realizing the long term goals realistically, skill based education is indispensable. Skill based education makes the learning as meaningful and holistic. Meaningful learning is always active, cognitive and constructive in nature. Holistic learning follows learning to know, learning to do, learning to be and learning to live together with view to make the learner as well-rounded individual.

Attaining meaningful learning, cultivation of competencies and holistic development are possible through skill development. Skill is the collection of experience, intellect, and passion in terms of doing. Skill is a foundational element for the development of the nation (Catt, 1988). It is an ability to perform a task in competent manner or it is an ability to perform a task leading to a specific pre-determined outcome. In fact, there are two types of skills i.e., hard skills and soft skills or they be refers as technical skills and non-technical skills are behavioural, non-domain specific and non-technical skills whereas hard skills are methodical, procedural tools and techniques, domain-specific, technical and technological or scientific skills. In soft skills, there are two kinds of skills i.e., thinking skill (personal skill) and social skills (interpersonal skills or meta-cognition skills or skills related to dealing with others).

Thinking skills refer to the abilities for adaptive and positive behaviours that enable individuals to deal with the demands and challenges of everyday life. It focuses on behaviour change or behaviour development approach designed to address a balance of three elements viz., a) Knowledge, b) attitude and c) competency. Presently, thinking skills are being reflected with 21st century skills which can be visualized in 4Cs i.e., 1)



Critical thinking and problem-solving skills, 2) Creative thinking and innovation, 3) Communication skills and 4) Collaboration skills

Critical Thinking:

Critical thinking is characterised by careful objective analysis and judgement. It is self-guided, self-disciplined thinking which attempts to achieve the highest level of quality. Individuals who think critically attempt to live rationally, reasonably and empathetically (Barell, 1984). Critical thinkers reflect on what they have learnt. Reflective or critical thinking is an active persistent and careful review of something that is believed. Reflective thinker does not accept the information passively. He/she looks for evidence to support the information.

The following behaviours/attributes are characteristic of a reflective practitioner.

- Reflects on and learns from experience.
- Engages in ongoing inquiry.
- Solicits feedback.
- Remains open to alternative perspectives.
- Assumes responsibility for own learning.
- Takes action to align with new knowledge and understandings.
- Observes self in the process of thinking.
- Is committed to continuous improvement in practice.
- Strives to align behaviors with values and beliefs.
- Seeks to discover what is true.

In essence, reflective thinking is critical thinking. It is thinking about thinking which is known as meta cognition. However, critical thinking is reasonable and reflective thinking that is focussed on deciding what to believe or do.

Creative Thinking:

Creative thinking is higher order thinking which is equally as important as critical thinking. Jacobs (2010) tells, curriculum should nurture creativity in all learners. Creativity is characterised by invention and synthesis. Create means to bring something into existence that was not there previously. The one which was brought into the existence must have value. Creative thinking is bringing about new idea. Creativity is an active process. It is not an accident, not something is genetically determined. It is not what you learnt, but a consequence of your intention and determination to learn. Creativity is a skill that everyone can learn and have it. To be creative, you have to believe and act as if you are creative. Once you believe you are creative, you will begin to believe in the worth of your ideas and you will have the persistence to implement them. Being creative is essential to being a good teacher (Fryer, 1996). These teachers will appreciate creativity when they see it students. Both critical and creative thinking come together under higher order thinking skills. Students build confidence when they face challenges and overcome such challenges. This confidence paves the way for creativity. Divergent thinking makes the students to develop and take healthy risks. Rewards for achievements can create a learning environment where learners can achieve more. If learner has an influencing factor of mental health, challenges should be kept within the parameters of the learner's comfort and willingness.

Communication skills:

Communication is active and two-way process. i) Active Listening, ii) Clarity and Cohesion, iii) Confidence, iv) Diplomacy, v) Empathy, vi) Employment Communication, vii) Friendliness, viii) Good Conversational skills, ix) Good Humour, x) Group Discussion, xi) Interviewing, xii) Listening Skills, xiii) Negotiation Skills, xiv) Networking, xv) Non-verbal communication and xvi) Patience are the important elements of communication skills. Listening is an imperative and receptive skill that is of great use in careers across the globe (Rayudu, 1998). Receiving the message, understanding the message, evaluating merits and demerits of message, responding to message and remembering the needed part of message are primary steps in listening. Paying attention, showing that you're listening, providing feedback and responding appropriately are the key Acta Sci., 25(5), 2024



techniques to become as an effective listener. Non-Verbal Communication is effective for managing the student behavior positively. When a student is misbehaving or breaking a class rule, simply pause and look him/her in the eye. This is not to be intended as a threatening gesture, but one of authority. Many times, teachers need not to say anything; the student will feel the power of teachers' stare. This is a preventative measure for discipline problems.

Collaboration skills:

Collaboration is a useful skill that can be used to promote efficacy and productivity. It paves way to develop the understanding of alternate perspectives that are vital for the progression of society. Effective and successful collaboration is most productive when connected with information technology with a view to achieve educational goals (Jahng, et al., 2010). Using information technology in the development of collaborative skills is a powerful tool. It helps to promote cross-cultural education for improving mutual understanding between nations and cultures in the 21st century.

Strategies for developing thinking skills:

There are three core strategies for developing thinking skills. They are: 1) Questioning strategies, 2) Problem solving strategies and 3) Idea generation strategies (Concklin, 2012).

1. Questioning strategies:

It includes Bloom's Taxonomy, Revised Bloom's Taxonomy, William Model, Socratic Method and Webb's Depth of Knowledge Scale

Benjamin Blooms (1956) has designed this taxonomy. This taxonomy focussed on classification of cognitive thinking. It allows the teachers to identify the levels at which students are thinking. It provides framework for providing questions to all students. Lorin Anderson and Krathwohl (2001) have revised this taxonomy to make it relevant to the 21st century. This is two dimensional taxonomy involving knowledge dimension and cognitive process.

Some teachers view that this taxonomy is ladder. It begins with remembering questions to creating questions. Some teachers think that it follows higher order questions to gifted, middle order questions to average students and lower order questions to struggling students. Critical thinking can be applied using an inverted Bloom's taxonomy. No doubt, Bloom's taxonomy can serve as gauge for teachers to use assign activities or asking questions. It is a viable questioning strategy that can promote higher order thinking skills.

Revised Bloom's Taxonomy is concise model for analyzing educational outcomes in the cognitive area (remembering, thinking, reasoning, problem solving and creativity).

- It is the description of students' behaviours simple to complex, not teachers' behaviours, instructional methods and subject matter.
- ✤ It is an educational-logical-psychological classification system.
- It may be applied at different levels of education.
- It helps to specify the objectives, to plan learning outcomes and to prepare evaluation devices.

It has two dimensions: 1. Knowledge Dimension that tells what learners know and 2. Cognitive Process Dimension reflects on how learners think.

Knowledge Dimension:

- i) *Factual Knowledge*: Knowledge of basic elements in which students have to be required knowledge.
- ii) *Conceptual Knowledge*: This sort of knowledge looks into the relationships among the basic elements as well as their functions.
- iii) *Procedural Knowledge*: It refers to knowledge of how to do something and criteria for using techniques and methods appropriately.
- iv) *Meta Cognitive Knowledge*: It indicates Knowledge of cognition and knowledge of one's own cognition. It follows self-awareness, self-reflection, and self-regulation.

Cognitive Process Dimension:

1. *Remember*: It signifies retrieving knowledge from long term memory of the human brain.

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- 2. *Understand:* It reflects constructing meaning from the instructional variety of various contents or messages that includes oral, written and graphic communication.
- 3. Apply: It can be connected to carrying out or using a procedure in a given context.
- 4. *Analyze:* It means breaking the material into constituent parts and determine how parts of the material relate to one another.
- 5. *Evaluate:* It is associated with making judgments based on criteria and standards.
- 6. *Create:* It refers to putting elements together to form a coherent or functional whole or it also refers to reorganize elements into a new pattern or structure.

Williams Model: Williams (1969) developed model consisting three dimensions. First outlines the subject matter content. Second shows 18 strategies for teaching. Third focuses on 8 students behaviours which will demonstrate students' creativity. These 8 behaviours follow 8 levels of thinking. The first four levels are *fluency, flexibility, originality and elaboration*. These are cognitive processes. Next four levels are *curiosity, risk taking, complexity and imagination*. These are affective processes. At all events, this model focuses on creative behaviour. Cultivation of creativity reduces dropout rate, increases motivation, reduces stress, avoids personal conflicts, adjust to the new knowledge and makes independent judgements.

Williams (1969) proposed students outcomes with the eight behaviours. Teacher has to design questions that encourage these student behaviours.

- 1. Fluency: Questions generate many ideas, related answers or choices.
- 2. Flexibility: Questions encourage flexibility and seek to change everyday objects.
- 3. Elaborations: Questions expand, enlarge, and enrich possibilities the builds on prior ideas and thoughts.
- 4. Originality: Questions promote originality and seek new ideas by suggesting or changing content.
- 5. Curiosity: Questions promote curiosity and allow students to follow.
- 6. Risk taking: Questions deal with the unknown by asking students to try new things.
- 7. Complexity: Questions create structure in an unstructured setting.
- 8. Imagination: questions encourage imagination and help students visualize possibilities.

Socratic Method: Inquiry is at the heart of the Socratic dialogue or Socratic Method. This method is used as a process of inductive questioning. Teacher has to ask questions to provoke students to think about something. The questions should follow logical path that supports what teacher expects students to learn.

Paul (2002) has listed questions into six categories they are:

- 1. Questions that clarify: what is the example of?
- 2. Questions that probe assumptions: what is your assumption about...?
- 3. Questions that look for reason and evidence: what makes you believe this?
- 4. Questions about perspectives and viewpoints: what is another view about...?
- 5. Questions that look at consequences: how does this affect?
- 6. Questions about the question: why do I ask this question?

Webb's Depth of Knowledge Scale: Webb's Depth of Knowledge was created to look into the degree or complexity of knowledge that the content curriculum standards and expectations require (Francis, 2017). It focuses on the complexity of the mental process that takes to students to answer questions, perform task or create products. It follows four levels;

- Level-1 is known as recall level the includes facts, information or procedures.
- Level-2 is known as concept or skill level. Here students collect, classify, organise, estimate, observe and compare data.
- Level-3 is known as strategic thinking level. Here reasoning, planning and making conclusions are important. Students draw conclusions with evidence.



• Level-4 is known as extended thinking level and it is the highest level of thinking. Here students make interdisciplinary connections. It requires complex reasoning.

2. Problem Solving Strategies:

It includes Problem based learning through KWHLAQ Chart, CPS Model, Wallas Model, Decision Making Strategies and Strategic Thinking Activities

Problem based learning: It is a problem solving strategy that engages students in solving a real-life problem. Problem based learning orients students towards meaning making rather than fact finding. Problem based approach in classroom helps students to get clarity on concept and paves the way for future learning. Problem based learning gives an opportunity to students to collaborate with fellow students. This collaboration creates great ideas and strong motivation. Problem based learning develops work ethics also. Here, teacher's role is like a coach. He presents the problematic situation, acts as resource guide, consultant and co-investigator. The important steps are:

- **1.** Locate a real-world problem and connect it with learning goals.
- 2. Find a way for the students to enter the problem
- 3. After problem has been presented, they discus. The facts of the problems that are known to them.

They can use graphic organiser like KWHLAQ

- K- What we know
- W- What we want to know
- H- Howwill you find answers to the questions
- L- What we are learning about the problem
- A- How can we applyideas, principles sand skills
- **Q-** What new**questions**do we have.
- 4. Students create exact statement of the problem. This is the hypothesis formation.
- 5. Students identify resources to gather data.
- 6. Students finds and shares the information though interview.
- 7. Students develop solutions to the problem.
- 8. Students develop some sort of presentation and they may publish it.

Creative Problem Solving Model (CPS-Model)

We need to follow six steps to follow in CPS model. This model helps for collaborative approach also. Teachers can implement CPS model by looking into the essentials of content areas.

- 1. Mess finding (locate a problem)
- 2. Fact finding(listing all facts about the problem)
- 3. Problem finding(alternative ways to define the problem)
- 4. Idea finding(divergent thinking or brain storming for solutions)
- 5. Solution finding(idea evaluation)
- 6. Acceptance finding(implementing the solution)

Wallas Model: Wallas (1926) outlined four stages for creative problem solving. They are 1. Preparation, 2. Incubation, 3. Illumination and 4. Verification

In preparation, defining problem takes place. In incubation, unconscious activity takes place to help solve the problem. Here among certain activities, main activity focus is going on. In illumination stage, solution to problem becomes clear. In verification, checking about if the solution is the right solution or not, is essential. Teachers can use this model for all types of content areas.

Decision Making Strategies: In CPS model, decision making focuses on outcome.

The word '*Decide*' means to come to a conclusion or resolution. It is a solution selected after examining several alternatives. Decision is a choice whereby student comes to a conclusion about given circumstances or situation. Decision-making is an indispensable part of life of the student. Planning, organizing, coordinating, cooperating and controlling are carried through decisions. Decision making is a mental process. It is concerned Acta Sci., 25(5), 2024



with the detailed study of the available alternatives for finding the best possible alternative. It is selective, process, purposive, positive, committed, and rational (Holt, 1983).

Strategic Thinking Activities: In problem solving, strategic thinking activities are very important. Strategic thinking requires:

- Observe the situation
- Absorb the necessary information
- Analyse the information
- Predict the possible solutions
- Implement the idea.

Idea Generating Strategies: Brain storming and brain writing, creative dramatics and creative writing, and project based learning strategies (Larmer, 2010) are very important for idea generation.

For generating idea, note-making and note-taking skills also pay vital role. Basically, note taking happens in class or seminar or workshop. Note making happens at home or in the library. (a) Note-taking which involves listening to lectures and taking down notes i.e., the main and subordinate points. This is a skill every student needs to master. (b) Note-making is very similar to note-taking, except for the fact that note-making involves reading books and making notes, whereas note-taking involves listening to a lecture and taking down notes. Note-making is a more leisurely activity. Note-taking occurs when you take notes from a reading text or when you are listening to a lecture. Note-making happens when you fair up your notes for reference later.

In class, note taking is important for understanding and comprehension. It is like a record of different points of view. It is an aid for further study. It is also summary of arguments and ideas. Note-making is systematic way of making notes and arranging them in meaningful order. Note making is useful for quick reference. It preserves the large text in a concise and compact form. It facilitates for easy recapitulation and reconstruction of the text (Beyer, 1987). It helps to organize thoughts in coherent and logical manner. It helps for developing skills of comprehension, analysis and presentation of the text in note form. Techniques of note making or note taking include: i) It should be short. ii) It should include essential points. iii) It presents the entire text in nutshell. iv) Using abbreviation and symbols are needed. For example: =, >. Here, no need to write complete sentences.

Selecting Strategy and Creating Plan:

It is important to be successful when using new strategies. When designing lessons that build higher order thinking skills, teachers should not start with hardest strategy. They can begin with a strategy that seems easy to them. They start with one strategy each week and add more strategies progressively in relevance to the topic of study as they feel comfort and confident. It is to note that everything will not work perfectly but they should not give up endeavour. Incorporating higher-order thinking into the classroom requires creating a plan. Begin with using questioning strategy with your lessons. Bloom's taxonomy or Revised Bloom's taxonomy is the best choice because they are teacher friendly. Focus on analysing , evaluating and creating questions.

Choosing a lesson that works well for brainstorming is an important activity. Teacher has to make a plan for brainstorming at the beginning of the lesson so that students get into thinking about the topic. They need to connect brainstorming with creative writing. Initially, teacher has to think about what and how students can write creatively. Planning a discussion in class using Socratic method and Thinking about what teachers are expecting form students by the end of the discussion are essential elements. It is useful to use a photograph, picture with people or a primary source to get students empathize by incorporating creative dramatics. Teacher or educator needs to create questions based on Williams Taxonomy. Teacher should select at least four questions that apply for one strategy.

Depending upon the grade and content areas, the teacher has to select strategy and design plan. It is not easy to plan lesson, however keep in mind that the results will pay off in the end. Teachers need to produce students



who have the confidence to think for themselves and who can brainstorm their own ideas and questions. This makes the learning process more meaningful and powerful. Teacher needs to inspire his/her students to grow intellectually (Dewey, 1916). Teacher has to be the person that he/she needs to be. Assessment is essential in building higher order thinking skills. Assessment tells how students are progressing in their higher order thinking skills. There are many more strategies to promote higher order thinking skills. It is important for teachers to ask questions themselves if the students are thinking and building their skills that produce 21st century learners.

CONCLUSION

Providing equitable, culturally responsive and rigorous curriculum and instruction, creating emotionally, intellectually, and physically safe environments, meeting the needs of diverse learners, lesson clarity, instructional variety, and teacher task orientation are useful for strengthening skills among the learners. Scientific temper/scientific reasoning, self-directed learning, leadership qualities, lifelong learning, Information and Communication Technologies (ICT), moral and ethical reasoning, multi-cultural competencies, critical thinking, communication skills, collaboration/cooperative team work, analytical reasoning, reflective and research skills and disciplinary specific knowledge and skills are need to be cultivated for improving thinking skills.

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