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STRATEGIES OF BRAIN BASED LEARNING

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Brain Based Learning theory has been put into practice since 1980s. It has involved many educationist and psychologists to come in front and work on its diverse dimensions. A variety of teaching learning materials has been developed which was depended on the idea of BBL theory. Here are diverse approaches, which were used to develop instructional material based on Brain Based Learning theory.

1. **INTEGRATED THEMATIC INSTRUCTION (ITI):** Integrated Thematic Instruction (ITI) is an inclusive model designed by Susan Koualick in 1982 to boost student performance and teacher satisfaction in the light of brain compatible instructions. The major purpose of the model is to grow up responsible citizens. It encourages students to make thematic relations across disciplines related to social issues and personal concerns. Thematic instruction is characterized by a variety of different strategies. The teachers who incorporate thematic instruction use research based strategies such as:

a. Pick genuine themes that matter: Choosing themes that are authentic content connectors strengthens learners' capacity to build confidence between school subjects and apply them in real-world contexts. Choose concepts or thoughts that will blend disciplines and create bridges to fresh knowledge.

b. Employ supportive grouping: Using small, cooperative learning groups to support problem-solving.

c. Design inquiry based learning experiences: Designing hands-on activities that help learners to make real-world sense of concepts by applying what they have learnt.

d. Make a resource-rich classroom: Give a rich environment for exploring the theme in multiple avenues. Computer linked to the internet, magazines, materials to experiment with, and tools for creating records of learning all enable elaboration of new knowledge.

e. Connect to the local surroundings: Extend the classroom into the neighborhood, town, and environment by integrating them into the curriculum in meaningful ways.

f. Team with other teachers: Work together with colleagues to bring good quality ideas into the planning process and create strong links to other disciplines by distributing content expertise.

g. Give timely feedback: The actual world provides authentic feedback allowing us to internalize what victory or failure looks and feels like. Feedback in the classroom should replicate authentic learning situations by being timely and instructive.

h. Use technology effectively: Employ appropriate technology tools for students to explore ideas, engage in simulations, and make new connections. The nine brain-compatible elements of the ITI model designed by Susan Kovalik are:

a. Absence of Threat, b. Meaningful Content, c. Choices, d. Movement to Enhance Learning, e. Enriched Environment, f. Adequate Time, g. Collaboration, h. Immediate Feedback, and i. Mastery of the Content.

2. POWER OF TEN: A Canadian teacher, Trevor Calkins, developed a creative and innovative model of 'Power of Ten', which is a teaching learning approach of how to use numbers and based on researches on how brain learns. Trust, respect, and originality are component of this model. An inclusive set of materials, plans; and approaches for teaching numeracy at elementary and middle school levels; as well as providing supplementary support through arrangement of diverse conferences or workshops is also the prominent

features of the model (<http://www.poweroftn.ca/>). Calkins discarded the old methods of teaching numeracy and mathematics and arrived at a novel approach, namely Power of Ten, by pairing his view with the brain research, and formulated numeracy skills for the kids. According to Power of Ten, a Brain friendly Learning System for Numeracy Skills has following four parts:

a. The Power of Ten Visual Systems: The power of ten systems is a set of visual tools (ten-frame cards, place value cards and ten-frame egg cartons) designed to assist learners build up the basic underpinnings of number sense and is based on the idea that over eighty percent of learning is visual.

b. Mastering the Basics: A set of assessment materials is the next part of this system. It is planned for 4-8 class level to master the fundamentals which the learners got in initial part. It is dependent on the curriculum of Western Canadian Consortium.

c. Mathematics as a Teachable Manual: Third part is the teacher's manuals at primary, middle or higher levels, which join number sense, spatial sense and patterns with one another. Manuals are teaching apparatus that facilitate teachers to design learning activities in accordance with the interests of the learners.

d. Mathematics Activities: Fourth part contains dissimilar mathematics activities. Students learn mathematical concepts with the help of games and learning activities along with worksheets and assessment records.

3. COOPERATIVE LEARNING: It is an approach to organizing classroom activities into educational and social learning experiences. It differs from team work, and it has been described as “structuring positive interdependence”. Students must work in groups to complete tasks jointly towards academic goals. Unlike individual learning which can be competitive in nature, student learning helpfully capitalize on one another's resources and skills. Also, the teacher's responsibility changes from giving information to assisting student's learning. Each one succeeds when the group succeeds. It gives learners the opportunity to share and construct knowledge, problem solving and develop social and interpersonal skills. Five very important elements are recognized for the successful incorporation of cooperative learning in the classroom:

- a. Positive Interdependence
- b. Face-to-Face Interaction

- c. Individual and Group Accountability
- d. Social Skills
- e. Group Processing

There are a range of strategies of cooperative learning. For the current study following strategies were used:

I. JIGSAW: Jigsaw is a grouping strategy in which the members of the class are prearranged into “Jigsaw” groups. The students are then reorganized into “expert” groups containing one member from each jigsaw group. The members of the expert group work jointly to learn the material or solve the problem, then come back to their “jigsaw” groups to share their learning. This is an excellent method for improving learners’ teamwork and communication skills. In this way, the work of the expert group is quickly disseminated throughout the class, with each person taking responsibility for sharing a part of the puzzle. The Jigsaw strategy follows following steps:

1. Divide students into 5 or 6 person jigsaw groups. The groups should be dissimilar in terms of gender and capacity.
2. Select one student from each group as the leader.
3. Partition the lesson into 5-6 segments.
4. Allot each student to learn one segment, make sure students have direct access to their own segment.
5. Provide students time to read over their segment at least twice and become familiar with it. There is no need for them to memorize it.
6. Form provisional “expert groups” by having one student from each jigsaw group join other students assigned to the same segment. Give students in these expert groups time to talk about the main points of their segment and to practice the presentations they will make to their jigsaw group.
7. Bring the students back into their jigsaw groups.
8. Ask each student to present his or her segment to the group. Encourage others in the group to ask questions for explanation.
9. Roam around from group to group, observing the process. If any group is having difficulty, make a proper interaction. Ultimately, it’s best for the group leader to handle this task.

10. At the end of the session, give a quiz on the material so that students rapidly come to realize that these sessions are not just fun and games but really count (<https://www.jigsaw.org/#steps>).

II. Think, Pair, Share (TPS): TPS strategy is a cooperative learning technique that encourages individual participation and is applicable across all grade levels and class sizes. Students think through questions using three distinct steps encouraging individual participation:

a. Think: Students think independently about the question that has been posed, forming ideas of their own.

b. Pair: Students are grouped in pairs to discuss their thoughts. This step allows students to articulate their ideas and to consider those of others.

c. Share: Student pairs share their ideas with a larger group, such as the whole class. Often, students are more comfortable presenting ideas to a group with the support of partner. In addition, students' ideas have become more refined through this three step process. This is an excellent method for promoting critical thinking and articulate communication in the classroom. Step of Think, Pair, and Share: 1. Teacher poses a problem or asks an open-ended question to which there may be a variety of answers. 2. Teacher gives the students 'think time' and direct them to think about the question. 3. Following the 'think time' student's turn to face their Learning Partner and work together, sharing ideas, discussing, clarifying and challenging. 4. The pair then shares their ideas with another pair, or with the whole class. It is important that students need to be able to share their partner's ideas as well as their own (Source- <https://www.teachervision.com/group-work/cooperativelearning/48547.html>)

III. Round Robin Brainstorming: In Round Robin Brainstorming the class is divided into small groups (4 to 6) with one person appointed as the recorder. A question is posed with many answers and students are given time to think about answers. After the "think time", members of the team share responses with one another round robin style. The recorder writes down the answers of the group member. The person next to the recorder starts and each person in the group in order give an answer until time is called.

Step 1 – Gather your team together around a table. Give each person index cards so that they can record their ideas on individual pieces of card.

Step 2 – Explain the problem that you want to solve. Be specific about the objectives of the brainstorming session. Answer questions, but discourage discussion. The goal in this step is to allow individual people to think creatively without any influence from others.

Step 3 – Have each team member, in silence, think of one idea and write it down on an index card.

Step 4 – Once everyone has written down an idea, have each person pass their idea to the person next to them. Everyone should now be holding a new card with their neighbor's idea written down on it.

Step 5 – Have each person use their neighbor's idea as inspiration to create another idea. Then ask each person to hand in their neighbor's card, and pass their new idea to the person next to them to repeat step 4.

Step 6 – Continue this circular idea swap for as long as is necessary to gather a good amount of ideas. When the time is up, gather up all the ideas. You can now collate them, eliminate any duplicates and discuss them further as required (Source-<https://www.mindtools.com/pages/articles/round-robinbrainstorming.htm>)

4. Five Finger Paragraph (FFP): The Five Finger Paragraph is a brain-based learning method for writing paragraphs and five paragraph essay developed by Johnnie W. Lewis for all students, age 5-18 and college. The Five Finger Paragraph product/services are available for two different audiences' public/private school students or Home School/Home Study students. The public/Private school materials are divided into four different grade groupings (Grades 7-12, Upper Elementary, Middle Elementary, Primary Elementary). The products in the Home School/Home Study curriculum category cover all grades in K-12 and are appropriate for students who are either taught at home or helped with their homework at home by parents/adults. According to Lewis "The Five Finger Paragraph is a BBL method for teaching classroom or home schooled students to write basic paragraphs and five paragraph essays. The color-coded kinesthetic method uses mnemonics so that the student assimilates the method more quickly and remembers it longer than traditional rubrics." (Source-<http://www.thefivefingerparagraph.com>)

5. 4MAT Cycle: The 4MAT model was originally developed by Bernice McCarthy in 1980. It is based on research from many fields, but mainly is a synthesis of findings from

the fields of learning styles, and right and left brain dominance. It entails the use of right and left-mode strategies within four distinct phases of the learning cycle.

- a. Experiencing
- b. Conceptualizing
- c. Applying
- d. Refining

As an instructional design tool, 4MAT gives teachers and trainers a systematic way to train all learners to think and learn well. As a professional development tool, it provides a framework for assessing the quality of any learning experience. As an organizational model, it offers a method for creating an environment for continuous learning and development. (Source- <http://www.4mat4learning.com.au/what-is-4mat/>)

6. STREAM: STREAM is an acronym for Science, Technology, Religion, Engineering, the Arts and Math. In the STREAM classroom, there is a flow of ideas over and across several subject areas. The success of the STREAM program requires a continuous flow of communication, collaboration, and planning among faculty, staff, administration, parents, and students. STREAM is not a new curriculum, but a framework for creative instruction and the facilitation of learning. STREAM uses technology to advance the experience. Students will receive a balance of traditional instruction and project based learning. They will use the science lab, whiteboards, iPods, and laptops to access the internet to explore, process, and apply concepts taught. Our children need to be able to inquire, think, investigate, and innovate to succeed in their education career and beyond. STREAM will help prepare our students for successful careers in a 21st century workforce. There are a variety of ways parents, grandparents, alumni, parishioners, and other supports can help successfully implement STREAM at School. STREAM is not a new curriculum, nor is it a specific subject but a creative method of teaching a concept across a variety of subjects. For example, the sixth grade might study ancient Greece; in advance of the segment, teacher will meet and collaborate. Then, students might learn about the history and architecture of Greece in Social Studies, discuss and make models of Greek columns on Art class, or discuss and plan a mini-Olympiad in gym class. For students this means the concepts are learned and reinforced across the curriculum rather than in just one subject (Wikipedia)

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