

## Opinions of Science Teachers on Active Learning in Science

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### Abstract

*The main objective of the study was to study the opinion of Science Teachers on Active Learning Strategies. Survey based Research Methodology is used to study the opinion of School Teachers. Opinionnaire was prepared to study the opinion of Science Teachers on Active Learning Strategies, consisting of 50 items on three point scale under 5 components namely (1) Planning, (2) Material Development, (3) Teacher-Learning (4) Evaluation (5) Class room Interaction. The sample comprised of 238 Science teachers of English Medium Schools of Gujarat State. The samples were randomly selected for the study. Percentage analysis is done to analyse the data collected by 238 Science Teachers. The study group consisted of 164 females and 74 male Teachers in age ranging between 24yrs to 48yrs. The percentage analysis of the opinionnaire indicated that using active learning approach the creative skill, problem solving ability, experiential skills can be enhanced whereas this approach excludes the introvert and cannot be used to teach on all the contents. This strategy demands proper planning of active learning strategy to be able to be performed at school level and within the classroom and also be able to allow course completion.*

**Key words:** Traditional Classroom, Active Learning, Classroom Teaching, Assessment, Evaluation

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### I. INTRODUCTION

Education is a good way of life through which the spread of culture occurs. People search new ways to express oneself in natural development and grow accordingly. Education is beneficial for everyone who are in need of change, and change is good for people who can direct its course. People need knowledge, intentions, intelligence, and good will to turn this change into their advantage. Progressive education in a democratic society is about change in thoughts, feelings, and internal restraints (Eldridge, 1998; Rockefeller, 1991).

A traditional classroom is where a teacher tempers and regulates the tide of information and knowledge. Students are expected to continue developing their knowledge of a subject outside of school through homework, exercises, assignments etc. Here, students' main resource is their instructor who teaches them face-to-face. A traditional classroom involves a standard curriculum delivered by a teacher in-person. Standardized tests are dispensed at regular intervals to test the students' comprehension. This model is where students' time, place and pace of learning goes constant.

Classroom teaching and learning is a little different, complex, multilayered, and social experience. Many things happen at the same time, and the students and teacher must translate and process these events with considerable rapidity. Teaching is not a one-way transmission of information, for students get impact about the process as much as the teacher. The teacher plays an important role in bringing about a meaningful classroom environment for students, but in the final analysis, it is the social and psychological activities and responses of each student that determines what he or she learns at the end of the day.

The single most essential aspect in determining a student's educational outcomes is how that student recognises, analyses, processes, and understands classroom activities—not what the teacher does. When making assumptions from observations of student performance, teachers and outside observers must be cautious (either formal or informal). The students' perceptions, interpretations, and understandings may differ dramatically from what an outside observer sees. A student's performance on an assessment instrument, for example, may differ significantly from the teacher's interpretation, because students can answer questions and solve problems in a variety of ways.

Different theoretical viewpoints and philosophies of education are widespread in classrooms because of the complexity. These various viewpoints enrich our understanding of classroom teaching and learning, but they all believe in a perfect classroom experience for all students. Fundamentally divergent philosophical assumptions about education and human existence result in fundamentally varied curriculum and classroom practice criteria. Some of these disagreements have lasted for generations, and the argument will almost certainly continue. Nonetheless, in recent years, we have gained a better grasp of the dynamics and complexity of classroom teaching and learning.

Teachers make hundreds of real-time judgments and support dozens of interactions with their kids every day.

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## II. RATIONALE OF THE STUDY

Since time immemorial, traditional lessons have always involved teachers giving students the subject content and asking them to simply write those concepts, find the content in the textbook to write the answer to the questions given, match the words, definitions etc to students to write. When it comes to test the students, they are assessed by how produce the information which they have memorized. The test is taken without application to concepts.

Those students', who were "taught" this way, could score very good marks but they hardly apply the knowledge in their daily life. These traditional strategies stem from the assumption that students absorb the scientific content of many simply by writing.

Teachers' styles of teaching and teaching methods and techniques may also be factors that affect students' learning (Çimer, 2004). Students are not happy with the way that subject content is taught, they may show disinterest in and negative attitudes towards subject and its teaching. From this perspective, there appears to be a clear need for further and deeper insight into the content that may not cause low achievement.

Therefore, the aim of the present study "Opinions of Science Teachers on Active Learning in Science" is to find out the how teachers Planning cause students to get involved in learning, the different kind of material developed by the teacher cause the students to participate in class room activities and make the class room interactive so that the Teaching-Learning can happen hand in hand.

## III. OBJECTIVES

The objective of the present study is:

1. To study opinions of Science teachers on Active learning in Science
2. To study opinions of Science male and female teachers on Active Learning in Science
3. To study opinions of Science graduates and post-graduates teachers on Active Learning in Science

## IV. RESEARCH QUESTIONS

1. What are the opinions of Science teachers on Active learning in Science?
2. What are the opinions of Science male and female teachers on Active Learning in Science?
3. What are the opinions of Science graduates and post-graduates teachers on Active Learning in Science?

## V. RESEARCH METHODOLOGY

This study is a survey-based descriptive research study.

### Population

The population comprises of Science teachers of English Medium Schools across Gujarat.

### Sample

The sample for the study comprised of

### Sampling Technique

The researcher had use Random sampling techniques to select the sample.

### Research Tools

The researcher had use an opinionnaire to collect the opinions from Science teachers on Active learning in Science.

### Data Analysis Technique

The researcher had use percentage analysis to analyze the collected data.

Percentage analysis on Opinion Opinions of Science Teachers on Active Learning in Science

| S. No. | OPINION                                                                                                                  | Agree | %     | Neutral | %     | Disagree | %     |
|--------|--------------------------------------------------------------------------------------------------------------------------|-------|-------|---------|-------|----------|-------|
|        | <b>PLANNING</b>                                                                                                          |       |       |         |       |          |       |
| 1      | Chalk and talk method is more effective than making students learn through active learning strategies.                   | 42    | 17.65 | 31      | 13.03 | 165      | 69.33 |
| 2      | Student's interest in learning can be developed through various strategies of active learning.                           | 124   | 52.10 | 29      | 12.18 | 85       | 35.71 |
| 3      | Active learning strategy used in classroom teaching makes it more convenient for the teacher to explain the concepts.    | 119   | 50.00 | 28      | 11.76 | 91       | 38.24 |
| 4      | The difficult concepts can be made easier to understand and learn through active learning.                               | 121   | 50.84 | 42      | 17.65 | 75       | 31.51 |
| 5      | Teaching of Active Learning is difficult in residential school where students cannot go outside to procure the material. | 144   | 60.50 | 20      | 8.40  | 74       | 31.09 |
| 6      | Active learning develops logical thinking and reasoning                                                                  | 164   | 68.91 | 18      | 7.56  | 56       | 23.53 |
| 7      | Active learning strategies are more time consuming                                                                       | 112   | 47.06 | 11      | 4.62  | 115      | 48.32 |
| 8      | Active learning strategies are best for challenging concepts.                                                            | 139   | 58.40 | 18      | 7.56  | 81       | 34.03 |
| 9      | Some topics are difficult to be performed in rural and remote areas.                                                     | 96    | 40.34 | 23      | 9.66  | 119      | 50.00 |
| 10     | Teaching of some topics within the classroom by active learning is not possible.                                         | 71    | 29.83 | 30      | 12.61 | 137      | 57.56 |
|        | <b>MATERIAL DEVELOPMENT</b>                                                                                              |       |       |         |       |          |       |
| 11     | Active learning promotes Experiential learning.                                                                          | 129   | 54.20 | 16      | 22.77 | 93       | 39.08 |
| 12     | Active learning indulge all the students altogether.                                                                     | 131   | 55.04 | 5       | 23.13 | 102      | 42.86 |
| 13     | Course completion cannot go parallel with active learning strategies in classroom teaching.                              | 118   | 49.58 | 10      | 20.83 | 110      | 46.22 |
| 14     | Concepts are easily understood through Active learning strategies.                                                       | 120   | 50.42 | 12      | 21.18 | 106      | 44.54 |
| 15     | Most of the contents can't be taught through Active Learning Strategy.                                                   | 123   | 51.68 | 9       | 21.71 | 106      | 44.54 |

|                          |                                                                                                                                 |     |       |    |       |     |       |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----|-------|----|-------|-----|-------|
| 16                       | Material developed for Active learning is costly.                                                                               | 110 | 46.22 | 26 | 19.42 | 102 | 42.86 |
| 17                       | Some times to actively participate in the class students have to invest more money in buying the materials for active learning. | 132 | 55.46 | 16 | 23.30 | 90  | 37.82 |
| 18                       | The materials through which active learning will take place are not easily available.                                           | 99  | 41.60 | 13 | 17.48 | 126 | 52.94 |
| 19                       | Active learning develops technology oriented learning.                                                                          | 119 | 50.00 | 7  | 21.01 | 112 | 47.06 |
| 20                       | Materials developed by you are not effective most of the times.                                                                 | 71  | 29.83 | 25 | 12.53 | 142 | 59.66 |
| <b>TEACHING LEARNING</b> |                                                                                                                                 |     |       |    |       |     |       |
| 21                       | Students learn better when the concept is well explained by the teacher.                                                        | 121 | 50.84 | 4  | 21.36 | 113 | 47.48 |
| 22                       | Teaching through active learning strategy helps in making child more focused in studies.                                        | 133 | 55.88 | 9  | 23.48 | 96  | 40.34 |
| 23                       | Active learning helps the child to connect the learned concepts in their real life.                                             | 140 | 58.82 | 8  | 24.72 | 90  | 37.82 |
| 24                       | Teaching Concepts through Active learning is challenging in the classroom                                                       | 138 | 57.98 | 11 | 24.36 | 89  | 37.39 |
| 25                       | Teaching Concepts through Active learning is challenging to Students with High IQ and High Achievers.                           | 126 | 52.94 | 2  | 22.24 | 110 | 46.22 |
| 26                       | The expected learning outcome is achieved through Teaching Concepts through Active learning.                                    | 129 | 54.20 | 5  | 22.77 | 104 | 43.70 |
| 27                       | Concepts taught through Active learning helps in better retention                                                               | 138 | 57.98 | 2  | 24.36 | 98  | 41.18 |
| 28                       | Active learning promotes problem solving.                                                                                       | 118 | 49.58 | 13 | 20.83 | 107 | 44.96 |
| 29                       | Active learning builds up the teacher confidence.                                                                               | 123 | 51.68 | 6  | 21.71 | 109 | 45.80 |
| 30                       | Active learning also develops teacher's rapport in the class room.                                                              | 129 | 54.20 | 3  | 22.77 | 106 | 44.54 |
| <b>EVALUATION</b>        |                                                                                                                                 |     |       |    |       |     |       |
| 31                       | Students result is enhanced by memorizing the contents.                                                                         | 98  | 41.18 | 8  | 17.30 | 132 | 55.46 |
| 32                       | Students active learning strategy helps in bringing good result.                                                                | 122 | 51.26 | 17 | 21.54 | 99  | 41.60 |
| 33                       | Active learning strategy used in classroom teaching helps in better understanding among the students.                           | 141 | 59.24 | 7  | 24.89 | 90  | 37.82 |
| 34                       | Active learning boost the confidence in children.                                                                               | 138 | 57.98 | 12 | 24.36 | 88  | 36.97 |
| 35                       | Active learning makes the class room environment joyful.                                                                        | 126 | 52.94 | 3  | 22.24 | 109 | 45.80 |
| 36                       | Active learning reduces the pressure of a typical classroom with stress free.                                                   | 163 | 68.49 | 6  | 28.78 | 69  | 28.99 |

|                              |                                                                                                        |     |       |    |       |     |       |
|------------------------------|--------------------------------------------------------------------------------------------------------|-----|-------|----|-------|-----|-------|
| 37                           | The expected learning outcome of the topics are best through Active Learning.                          | 115 | 48.32 | 20 | 20.30 | 103 | 43.28 |
| 38                           | The students did not develop an understanding of major course concepts while active learning           | 112 | 47.06 | 16 | 19.77 | 110 | 46.22 |
| 39                           | The planned strategies do not meet the level when performed in real class room setting.                | 113 | 47.48 | 3  | 19.95 | 122 | 51.26 |
| 40                           | The retention of the concept is more by topics taught through active learning.                         | 147 | 61.76 | 6  | 25.95 | 85  | 35.71 |
| <b>CLASSROOM INTERACTION</b> |                                                                                                        |     |       |    |       |     |       |
| 41                           | Develop creativity among the students                                                                  | 159 | 66.81 | 5  | 28.07 | 74  | 31.09 |
| 42                           | Active learning helps introvert students to interact in the classroom.                                 | 163 | 68.49 | 2  | 28.78 | 73  | 30.67 |
| 43                           | Activities done in the class excludes the introvert.                                                   | 153 | 64.29 | 9  | 27.01 | 76  | 31.93 |
| 44                           | When students perform activities under Active learning approach, they get gelled up easily.            | 85  | 35.71 | 11 | 15.01 | 142 | 59.66 |
| 45                           | The students get comfortable in communication with teachers when they perform activities in the class. | 123 | 51.68 | 6  | 21.71 | 109 | 45.80 |
| 46                           | Activities performed in class in good for Classroom unity.                                             | 130 | 54.62 | 16 | 22.95 | 92  | 38.66 |
| 47                           | Activities performed in classroom helps in students to be more confident.                              | 168 | 70.59 | 2  | 29.66 | 68  | 28.57 |
| 48                           | Activities done in classroom removes stage fear                                                        | 151 | 63.45 | 3  | 26.66 | 84  | 35.29 |
| 49                           | Activities done in classroom enhance communication skills                                              | 120 | 50.42 | 8  | 21.18 | 110 | 46.22 |
| 50                           | Activities done in classroom address the social issues.                                                | 76  | 31.93 | 9  | 13.42 | 153 | 64.29 |

## VI. FINDINGS OF THE STUDY

### Findings of the components:

#### (1) PLANNING

Good Teachers do proper planning in terms of making lesson plan which makes the teaching loved by children. Most teachers agreed that keeping activity over chalk and talk in the lesson plan and allowing students do activities makes the teaching effective, in the same line many teachers disagreed that it becomes more easy for the teacher to explain the difficult concepts when students actually do the activity in class.

Most teachers agreed that active learning strategies help students to develop logical thinking and are best for explaining challenging concepts. Average percentage of teachers opined that active learning strategies are time consuming.

## (2) MATERIAL DEVELOPMENT

To make the students understand the concepts easier to understand the right development of material is equally important. Most of the teachers agreed that appropriate material developed for active learning helps in experiential learning, easy understanding and include all the students together. Most teachers view that procuring of materials for active learning is costly at times and also the availability is a big question. On contrary most teachers believe that completion of syllabus becomes difficult with active learning approaches. Maximum percentage of teachers opined that many times the material developed for active learning approach are not much effective on students.

## (3) TEACHING-LEARNING

On an average teachers believe that teachers explanation helps students to learn the concept better whereas maximum teachers agreed that active learning strategies make students more focused in studies, students can easily recall the knowledge, helps in problem solving, makes child more confident and teacher can have good rapport in classroom. Most teachers are in favour of the opinion that when teaching occurs along with activity then students can easily learn the concept and also connect them in their routine life. Most teachers agreed that Teaching through active learning is challenging and also to students with high IQ level.

## (4) EVALUATION

When students are evaluated after the classroom teaching some teachers agreed that when they evaluate the students get good result by memorising the concepts while most teachers opined that students result get enhanced if they are involved into some activities. Most of the teachers believe that Students understand better when taught active learning strategies. Most teachers has agreed that active learning strategies make the teaching more interesting, joyful and makes the classroom environment stress free and have also agreed that this approach has led to better learning outcome among students as better retention in students have been evaluated. On average teachers believe that all the content cant be taught with active learning approach.

## (5) CLASSROOM INTERACTION

Interaction among students is the heart of Active Learning. Most teachers agreed that when students are given certain activity in class they interact with each other, get mixed and gelled up, thus the introvert students also gets chance to interact but most of the teachers have agreed that introvert students are excluded many times while class room activities. Most teachers agree that active learning makes students to freely communicate with each other also with teacher.

### **Research Question 1. What are the opinions of Science teachers on Active learning in Science?**

Majority of the science teachers believes that active learning develops logical and reasoning among students and are more applicable for teaching of challenging concepts. Teachers agreed that when students are indulged in active learning students work together with other classmates. Most of the teachers agreed that through Active learning approaches, experiential learning and competency based learning can be achieved. There were very minute percentage difference in the teachers who were in favour that Active learning develops

technology oriented learning. Most of the time the materials developed by the teachers are effective in bringing active learning outcome. Majority Teachers agreed that Activities done in class boost the confidence in child to represent their own self in front of others and also develop their creative skills. Most teachers agreed that class room learning becomes stress free and joyous when students perform activities. Most teachers agreed that the expected learning outcome are most of the times achieved through Active Learning.

### **Research Question 2. What are the opinions of Science male and female teachers on Active Learning in Science?**

Majority of male teachers believe that more money is invested to buy materials for active learning. Most of the Female teachers did not agreed that course completion becomes difficult when students are involved more in active learning. Many male teachers agreed that procuring materials for residential school is difficult for active learning strategies. Most female teachers did agree that students becomes more focused in studies when they learn through teaching through active learning strategies. Both Male and female teachers agreed that active learning helps students to connect in their real life that they learn in class. Most female teachers agreed that the Lesson plan including activities do not always meet the level when performed in real class room setting. Majority male teachers agreed that students get comfortable in communicating with their teachers when they perform activities in the class.

### **Research Question 3. What are the opinions of Science graduates and post- graduates teachers on Active Learning in Science?**

Majority Post graduate teachers did not agreed that Activities done in classroom address the social issues while the graduate teachers were in favour of the statement. Most of the Post graduate teachers agreed that Most of the contents can't be taught through Active Learning Strategy. Half of the Post graduate and graduate teachers agreed that when the concept explained by the teacher is well planned then students learn better. Most Post graduate teachers disagreed that majority of the contents can be explained through active learning. Most Graduate teaches agreed that students retain the concept more when taught through active learning. Many Post graduate teachers agreed that active learning helps introvert students to transform into extrovert and also while performing activities students get gelled up easily with other students. Most of the Graduate teachers agreed that activities done in groups helps in bringing unity in the classroom.

## VII. CONCLUSION

From this study it can be conclude that there were teachers who were in favour of chalk and talk approach to teach, some teachers also practice in giving students to write several times while other teachers believe activity oriented class, so it can be concluded that all the teaching pedagogy have their own importance and teaching pedagogy has both the sides of coins. The best teaching is happens when teaching involve combinations of strategies. It cannot be denied that student are afraid of some teachers and activities reduces this gap and becomes a bridge between student and teacher. Findings from this survey shows that:

- the classroom environment will be not so boring and therefore students would be attracted to learn more.
- creates positive learning environment
- it allows direct interaction between lecturers and students which students hardly do in normal learning session.
- it promotes open minded ideology because students are able to express opinion.
- it will enhance communication skill since everyone have to talk contribute feedback
- everyone will learn to respect someone else opinion.
- it allows students to personally engaged with the learning activities.
- encourage participation, motivate both students and teachers.

### VIII. IMPLICATIONS OF THE STUDY

Active learning improves student learning outcomes. As a result, active learning and a classroom with student-centered approach must be properly planned. This will benefit the quality of education.

Furthermore, the research shows that the active learning strategy shown to benefit slow learner, introvert students but does not contribute much to the high achievers.

Teachers can outline the learning styles of their students and can use best practises accordingly. They can plan activities that can be easily done within the vicinity of the classroom and also should not create a lag in the course completion.

Finally, the findings will give directions to students proper implementing and utilising variety of other active learning approaches that help their own teaching and learning process.

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