Peer Learning scenario from the perspective of Student Achievement and Peer Evaluation- An Experimental Study

Submitted In Partial Fulfilment of Requirements
For the Degree Of

Master of Education

By

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DECLARATION

I declare that this written report submission represents the work done based on my and / or others' ideas with adequately cited and referenced the original source. I also declare that I have adhered to all principles of academic honesty and integrity as I have not misinterpreted or fabricated or falsified any idea/data/fact/source/original work/ matter in my submission.

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Abstract

The study investigated Peer Learning scenario from the perspective of Student Achievement and Peer Evaluation among secondary school students of 7th grade in SSC board, Mumbai. The design for the study was post-test Achievement scores of experimental & control group design. All the 56 students from secondary schools within Mumbai metropolis constituted the population of the study. One secondary school was randomly selected and made into experimental and control groups. Science Achievement Test was prepared by the researcher and validated by Two senior science lecturers from education department. Science Achievement Test was administered to the students by the researcher. Data collected were analysed using t-test statistics. The results indicated that students taught science using peer tutoring instructional method achieved higher than those taught using traditional lecture-based method. It was recommended that, teachers need to diversify their method of teaching biology such as peer tutoring as it will assist in higher academic achievement of learners.

The literature survey done show that there is an overwhelming acceptance of Peer learning among researchers and educational organisations, however this strategy has not been very frequently used in secondary schools. Implementing Peer learning is a complex process. Much of the research on Peer learning has proposed that the benefits are usually long term rather than having an instant effect.

Keywords: Peer learning, Evaluation, Instructional method, Academic Achievement, Science.

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INTRODUCTION

CHAPTER 1

INTRODUCTION

"Tell me and I forget, teach me and I may remember, involve me and I learn"

-Benjamin franklin

1.1 Introduction

Introduction:

There is a paradigm shift from traditional teachers teaching to student centered learning and teaching. One of the long historical method of teaching in educational systems has always being lecture. Teachers presented the principles, concepts and facts through instructor. Verbal learning, listening and take notes from comprehensive are the fundamentals of this method, explaining and describing the phenomena by the teacher has a major role. It has always been a monologue class where students act as a passive member of the community only to have great listening skill and note taking strength. In the more traditional or conventional approach, the teacher functions in the familiar role of classroom lecturer, presenting information to the students, who are expected to passively receive the knowledge being presented. Though the teacher-centered method is historically considered the more traditional approach, the education field has evolved to recognize the significant benefits of empowering students to be more active participants in their own learning.

These days teachers encourage student-centered learning by allowing students to share in decisions, believing in their capacity to lead, and remembering how it feels to learn.
The teacher is still the classroom authority figure but functions as more of a coach or facilitator as students embrace a more active and collaborative role in their own learning.
What is needed, therefore, is that learning involves a process of exploration and construction, and that knowledge is 'the outcome of the child's own activity' – 'neither the textbook nor the teacher is an authority'. And the purpose of education must be to prepare all citizens for a meaningful and productive life, so that they will build up to have a more constructive and reasonable knowledge at place.

1.1.1NEP 2020 (National Education Policy)

National Education Policy is student-centric. NEP 2020 has been articulated keeping in view the interests of students. NEP-2020 could help build their bright future because of its holistic educational concepts. NEP 2020 emphasized that education was the perfect tool for achieving empowerment.

Some of the important Student-centric policies of NEP 2020 are as follows:

1. **NO to "rote learning", and be prepared to "Learn how to learn":**

   The Early Childhood Care and Education (ECCE) program recommends "Discovery-based learning" & "Discussion-based learning" to realize this objective.

2. **Due Importance given to one's mother-tongue:**
   This policy will revitalize the otherwise-withering Indian languages, and is expected to give better comprehensive & expressive capabilities to students.
3. **The Three-language learning Formula :**
   There's provision to learn two other Indian languages. This approach is to promote Multilingualism, and it will begin in the Foundational Stage itself
4. **Simplified & highly-engaging curriculum:**
   simplified curriculum and engaging pedagogy, with minimum text books, students will now follow an activity-based, fun-filled learning style until 8th grade.
5. **Enhanced focus on India culture & Heritage:**
   Students would be taught Indian culture, its heritage, traditions and its heroes in every sphere like Science, Mathematics, Medicine, Philosophy, Arts and Engineering. This would develop better self-respect, confidence and appreciation for own country in the minds of students, which will go a long way towards national integration.
6. **Positive Changes in Student assessment**
   Students will be tested for their conceptual understanding rather than rote-learning. Exam-fear will be a thing of the past. The overall approach can be seen as 'light but tight'.

In this new paradigm, a student is at the centre stage. Today's student is mature and informed, learns differently, learns while working, learns throughout life, and expects flexibility. Also, as industries recalibrate and adapt to digital, socioeconomic, ecological, and demographic drivers of change, most occupations and job roles are undergoing a fundamental transformation. In this backdrop, the National

Education Policy (NEP 2020) unveiled by MHRD, now the Ministry of Education, is a pertinent move to prepare the country's workforce for the future needs of a knowledge economy.

1.1.2 Benefits of student-centered learning

Student-centered learning must start with the Teacher. Teachers encourage student-centered learning by allowing students to share in decisions, believing in their capacity to lead, and remembering how it feels to learn. The teacher is still the classroom authority figure but functions as more of a coach or facilitator as students embrace a more active and collaborative role in their own learning.

Benefits of a Student-Centered Classroom

- Education becomes a more shared experience between the instructor and the students, and between the students themselves.
- Students build both collaboration and communication skills.
- Students tend to be more interested in learning when they can interact with one another and participate actively in their own education.
- Students in the class learn to work independently and to interact with others as part of the learning process.
- Sometimes called the "Guide on the Side" style, the student-centered model builds in more equanimity between the teacher and student, with each playing a role in the learning process. The teacher still exercises authority, but is more likely to act as a facilitator, coaching students and assisting them in their learning.
- This approach, which has grown in popularity over the past several decades, champions student choice and facilitates connections among students, embracing the philosophy that, for a student to truly learn, they must be actively involved in the process.

1.1.3 Peer Learning and its importance

Peer Learning is not a distinct, undifferentiated instructional procedure. It includes a broad sweep of ventures. These ranged from the usual model, at which
point senior juniors tutor younger students, to the more creative education containers, in which juniors in the alike period form participations to assist each other accompanying two together course content and individual concerns.

Other models are complicated conversation, seminars, private study groups, a friend arrangement or exhorting, peer assessment blueprints, cooperative project or lab work, projects in different judge groups, business advising and community ventures.

Peer learning should be mutually beneficial andinclude the sharing of information, thoughts and involvement between the members. It can be portrayed as a way of moving past autonomous to forbid or shared learning. Students learn an extraordinary bargain by clarifying their thoughts to others and by taking part in exercises from which they can learn from their peers. They create aptitudes in organizing and arranging learning exercises, working collaboratively with others, giving and accepting criticism and assessing their possess learning. Peer learning is getting to be an progressively imperative portion of numerous courses, and it is being utilized in a assortment of settings and disciplines in numerous countries. Formalized peer learning can offer assistance understudies learn successfully. At a time when college assets are extended and requests upon staff are expanding, it offers understudies the opportunity to memorize from each other. It gives them impressively more hone than conventional educating and learning strategies in taking duty for their possess learning and, more generally, learning how to learn. It is not a substitute for teaching and activities designed and conducted by staff members, but an important addition to the list of teaching and learning activities that can enhance the quality of education.

Vygotsky (1978) suggested that in order for learning to take place, people should talk and interact with each other. People naturally learn from each other and work cooperatively in their everyday lives. Vygotsky viewed cooperative learning approach as important part of a process which leads to the social construction of knowledge.

Christison (1990) considered cooperative learning as a good strategy to increase the attention and motivation of the student.

Oslen and Kagan (1992) reported cooperative learning as an activity which depends on the social interaction and exchange of information between students working in groups and each student is accountable for his own learning.

1.1.4 Reciprocal Peer Tutoring

Reciprocal Peer Tutoring is a good way to review relevant information and practice skills in the classroom. It a teaching intervention strategy in which students alternate between the role of tutor and tutee. Students get to be the learner and the teacher! When you use this method, you will group two or more students together, and it can be used for any subject or age group. RPT allows each of your students the chance to teach a review lesson, monitor other students in the group, and evaluate each other's work through observations or work samples. It is a form of peer-assisted learning involving structured switching of tutor–tutee roles amongst students of the same academic year. In this model, your students are a huge part of the whole process. The students can prepare instructional materials as well as receive immediate feedback from their peers. It is important to remember that RPT should be used for reviewing content or practicing a skill, i.e. multiplication facts, and not for introducing new materials.

The Benefits of Reciprocal Peer Tutoring

Reciprocal Peer Tutoring increases academic achievement while simultaneously decreasing disruptive behavior. It is one of the strategies improves both grades and behaviors. Through the group settings, RPT also promotes social competence, social skills awareness, and peer acceptance. The students get to watch their partners model appropriate social skills, and they are more likely to follow suit.

The students benefit from receiving more one-on-one instruction and engaging in active learning. Students are also able to track their own progress, which gives them more accountability over their learning. This model is especially beneficial in inclusive classrooms because groups can address a wide range of learning needs and disabilities. All students can benefit from the tutoring, regardless of whether they are the tutor or tutee.

1.1.5 What outcomes does peer learning aim to promote?

Working with others

The skills involved in working with others include teamwork and being a member of a learning community. Peer learning can prompt a sense of responsibility for one's own and others' learning and development of increased confidence and self-esteem through engaging

Working with others

The skills involved in working with others include teamwork and being a member of a learning community. Peer learning can prompt a sense of responsibility for one's own and others' learning and development of increased confidence and self-esteem through engaging in a community of learning and learners. Much learning takes place from sharing others' experiences, existing knowledge and skills. Students learn to acknowledge the backgrounds and contributions of the people they are working with. Peer learning necessarily involves students working together to develop collaborative skills. Working together gives them practice in planning and teamwork and makes them part of a learning community in which they have a stake

Critical enquiry and reflection

Challenges to existing ways of thinking arise from more detailed interchanges between students in which points of view are argued and positions justified. It provides opportunities for formulating questions rather than simply responding to those posed by others. There is evidence to suggest that fostering critical reflection and reassessment of views more readily comes from interchange between peers than even from well planned discussion sessions with teachers. Depending on the particular activities chosen, peer learning can provide opportunities for deep engagement in the learning process, as students are learning through their relationships with peers, not just trying to 'beat the system'. Students are often better able to reflect on and explore ideas when the presence and authority of a staff member do not influence them. In peer learning contexts students generally, communicate more about the subject area than they do when staff are present. They are able to articulate what they understand and be more open to be critiqued by peers, as well as learning from listening to and critiquing others

Self and peer assessment

There are enough opportunities for formative assessment and getting feedback from staff in order to significantly develop skills and concepts. Peer learning settings provide opportunities for additional self and peer assessment of a formative kind. It provides opportunities for giving and receiving feedback on one's work and a context for comparing oneself to others. This mirrors the kinds of informal assessment activities which take place daily in the world of work: self-assessment and peer judgements are more common and can often have a more powerful influence in professional work than formal appraisals. Practice in identifying criteria to assess one's own learning and applying this in a variety of circumstances is a key element of sustainable assessment needed for lifelong learning

1.1.6 Active Learning

Active learning methods ask students to engage in their learning by thinking, discussing, investigating, and creating. In class, students practice skills, solve problems, struggle with complex questions, make decisions, propose solutions, and explain ideas in their own words through writing and discussion. Timely feedback is critical to this learning process either from the instructor or peer feedback from fellow students. Education research shows that incorporating active learning strategies into university courses significantly enhances student learning experiences.

Active learning shifts the focus of learning – from passively (and possibly unquestioningly) digesting information to being accountable for actively engaging with sources and perspectives. And when students share ideas, they learn to build stronger arguments, challenge presumptions and recognize leaps of logic. Active learning pulls students out of their comfort zone by creating an environment where risk taking is encouraged. As they get more comfortable sharing their thoughts, defending their conclusions and building on each other's ideas, they'll gain confidence and self-possession

Active learning techniques in classroom

- ✓ **Think-Pair-Share** activity to encourage all students to interact with the material. In this activity, the instructor states an open-ended question. Ask students to spend a minute or two thinking about and writing a response. Then ask students to pair with a partner to discuss their responses.

Reconvene the class after a few minutes, and call on individual students to share the pair's responses.

- ✓ **One Minute Paper** in your class as a formative assessment. At the end of class or just before a break, ask either: "What are the two most important points from today's session?" or "What was the muddiest (least clear) point from today's session?" Give students 1-2 minutes to write brief responses to turn in anonymously as they leave the classroom. Address student responses either during the next class or online.
- ✓ With **Peer Instruction**, you pause during class and ask students a conceptual question. Give students a few minutes to think about the question, and then have them provide answers, possibly using clickers. Then, have students spend a few minutes talking about their answers, usually in pairs, and try to convince each other that their answer is correct. Then have students answer again.
- ✓ Asking students to **work together in groups** is a very effective way to actively engage them with your course. For example, Gallery Walk is a cooperative activity during which groups move between stations to build on solutions or discussions begun by others. The Jigsaw is a structured cooperative learning activity that relies on individual accountability to reach group goals.
- ✓ Student groups can discuss **case studies** to apply course content to solve real world problems. Cases for the sciences can be found at the National Centre for Case Study Teaching in Science. The Case Consortium at Columbia University provides a collection of case studies for the fields of journalism, public policy, public health, and other disciplines.

1.1.7 Students Presentation

Student presentations are a common part of many courses at colleges and universities as they are one of the ways to improve learning of course material. The potential benefits of student presentations include greater class interaction and participation, increased interest in learning, new perspectives not covered otherwise, and improvement in communication and presentation skills. Students can gain knowledge not only from the research they and other students perform, but also by observing the other presenters' strengths and weaknesses to develop better communication and presentation skills.

In addition to the expected potential benefits of class presentations for presenters, the question is whether the audience (non-presenting students) benefits from class presentations. It is hoped and expected that non-presenting students in the class could also benefit from student presentations. These potential benefits for non-presenting students include learning different perspectives about the course material and improving communications skills by observing others. As with any presentation, the challenge is to get non-presenting students to pay attention and to be engaged in the learning experience. One way to overcome this challenge is to ask no presenting students to evaluate the presentations (peer-evaluations). We believe that peer evaluations could be a good way to get non-presenting students involved and engaged in the presentations in order to get the most benefit from the learning experience. Specifically, asking students to list what they learn from presentations through taking notes will promote (or force) greater involvement with the presentations. As a result of being actively engaged in the presentation, the students should benefit much more than if they had merely been passive viewers.

Advantages of Presentation based learning

Students Receive Authentic Assessment

Project-based learning creates more opportunities for authentic assessment than traditional methods of education. PBL allows students to show their capabilities in different ways. Students use different skills while working alone and within a group.

PBL also showcases students' ability to apply valuable organizational skills. These include researching, planning, and making decisions. Project-based learning offers teachers a variety of opportunities to assess their students.

Teachers also have many opportunities to offer students feedback on their projects. They also help them revise their plans.

Project-based learning focuses on real-world issues. So it allows teachers to get to know their students as people. The teacher and student are able to build a stronger relationship.

Promotes a Lifelong Love of Learning

Project-based learning allows students to have a say in what they learn. So, each student's curriculum builds off of their natural interests.Students do more than learn and memorize facts. They develop research skills and deepen their knowledge. This happens when the topic is something they care about.

The things students learn about that topic stay in their memory longer as well. Project-based learning encourages students to direct their own learning (with guidance).Students develop perseverance through hard work and in-depth research. They also learn to manage setbacks and obstacles.

Through project-based learning, students learn that failure is not only acceptable. It is an inherent part of the learning process. Students learn to make adjustments to their projects rather than giving up. Presenting projects to their peers gives students self-confidence and a feeling of empowerment. Students find their voice when they feel inspired to speak as experts on their topic.

It felicitates a Variety of Learning Styles

The reality is that every student has their own individual learning style. Traditional styles of teaching put many students at a disadvantage from the start.Project-based learning recognizes and celebrates the fact that students have a broad range of capabilities. It also realizes they can use more of these abilities in PBL than in traditional classrooms.PBL gives students the chance to create problem-solving processes and research methods. It also allows for different types of applications. The way students apply their knowledge is up to them.Students need to be able to use their areas of strength. When students have a genuine interest in what they learn they achieve at higher levels.

Improves Student Engagement

The difference with project-based learning is that it reflects students' interests. Student interest equals engagement,It allows students to see how different skills work together in real-life situations.

Student engagement means better learning outcomes for students. It often leads to better test scores as well.

Students are more engaged when learning how to solve problems that are important to them. It also helps to see how real-world problems affect life in their community.

Students Develop Personal and Social Responsibility

Project-based learning enables students and teachers to expand learning beyond the school building. The problems students are solving are applicable to life outside the classroom.

Studying real-life problems helps students develop personal and social responsibility.

Learning how to collaborate in a group is crucial to life in the real world. Life is about solving problems, and usually, we go about solving them with other people.

Forming relationships is a huge part of collaboration. Students learn how to work better in groups. They also learn how to listen to others, provide positive input, and resolve conflicts.

Students build positive relationships with their fellow students when they collaborate, they also develop relationships with their teachers and often their community members over the course of a project.

They will take these valuable skills with them and use them throughout their lives.

Promotes Independent Learning and Creativity

Independent learning and creativity are unique to project-based learning. In contrast, traditional education focuses on rote memorization and a singular curriculum.

Students get a choice in what they learn and the context in which they learn it. Students work better on their own when they have an interest in what they're learning. Students also get to think outside the box with project-based learning. They can use creative solutions and creative methods of thinking and research. There is no right way to do a project.

Thus, PBL allows students to research and present their findings in a way that makes sense to them. They also get to explore their creativity in the process.

- Encouraging kids to be independent and inquisitive – Activity-based learning focuses on independent investigation and analysis. By asking kids to work on their own and/or in small groups, this teaching method encourages students to be independently inquisitive, think critically, and learn from their own experience. This self-directed learning process in turn supports their acquisition of knowledge outside (as well as inside) the educational environment.

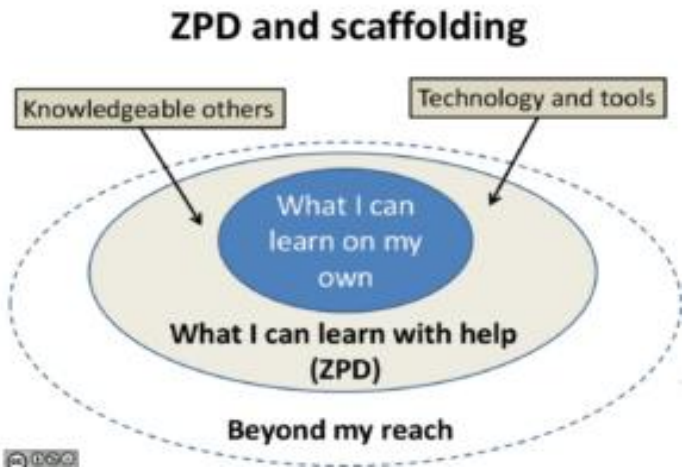
- Supporting social development – Activity-based learning encourages kids to take responsibility for their own learning experience, group-based activity work also helps students develop teamwork and social skills. These skills will later prove essential to their work and social life.

1.1.8 Theories of learning

Constructivism theory of learning

Social constructivism, a social learning theory developed by Russian psychologist Lev Vygotsky, posits that individuals are active participants in the creation of their own knowledge
Vygotsky believed that learning takes place primarily in social and cultural settings, rather than solely within the individual
Vygotsky acknowledged intrinsic development, but he argued that it is the language, writings, and concepts arising from the culture that elicit the highest level of cognitive thinking (Crain, 2005). He believed that social interactions with teachers and more learned peers could facilitate a learner's potential for learning. Without this interpersonal instruction, he believed learner's minds would not advance very far as their knowledge would be based only on their own discoveries.

For instance, students learn primarily through interactions with their peers, teachers, and parents, whereas teachers stimulate and facilitate conversation through harnessing the natural flow of conversation in the classroom. Social constructivism suggests that successful teaching and learning is heavily dependent on interpersonal interaction and discussion, with the primary focus on the students' understanding of the discussion
One of the core constructs of Vygotsky's theory of social constructivism is the zone of proximal development (ZPD), which emphasizes the role of the instructor in an individual's learning. The ZPD delineates the activities that a student can do without help, and the activities the student cannot do without the help of an instructor. The ZPD suggests that, with the help of an instructor, students are able to understand and master knowledge and skills that they would not be able to on their own
Once the students master a particular skill they are able to complete it independently. In this theory, the instructor plays an integral role in the students' acquisition of knowledge, rather than serving as a passive figure.
Educators often apply these concepts by assigning tasks that students cannot do on their own, but which they can do with assistance; they should provide just enough assistance so that students learn to complete the tasks independently and then provide an environment that enables students to do harder tasks than would otherwise be possible. Teachers can also allow students with more knowledge to assist students who need more guidance. Especially in the context of collaborative learning, group members who have higher levels of understanding can help the less advanced members learn within their zone of proximal development.



Experiential learning theory

Learning by doing. This is the basis for the experiential learning theory. Experiential learning focuses on the idea that the best ways to learn things is by actually having experiences. Those experiences then stick out in your mind and help you retain information and remember facts.
For teachers, creating opportunities for students to have experiences based on the things they are learning about is key. Teachers can help create environments where students can learn and have experiences at the same time.

Kolb's experiential learning theory

David Kolb is best known for his work on the experiential learning theory
The experiential learning theory works in four stages—concrete learning, reflective observation, abstract conceptualization, and active experimentation. The first two stages of the cycle involve grasping an experience, the second two focus on transforming an experience. Kolb argues that effective learning is seen as the learner goes through the cycle, and that they can enter into the cycle at any time.

Concrete learning is when a learner gets a new experience, or interprets a past experience in a new way.

Reflective observation comes next, where the learner reflects on their experience personally. They use the lens of their experience and understanding to reflect on what this experience means.

Abstract conceptualization happens as the learner forms new ideas or adjusts their thinking based on the experience and their reflection about it.

Active experimentation is where the learner applies the new ideas to the world around them, to see if there are any modifications to be made. This process can happen over a short period of time, or over a long span of time.

The experiential learning cycle rests on the idea that each person has a specific type of learning tendencies, and they are thus dominant in certain stages of experiential learning. For example, some learners will be more dominant in concrete learning and reflective observation, while others will be dominant in abstract conceptualization and active experimentation.

The four learning styles are:

Diverging: The diverging learning style is full of learners who look at things with a unique perspective. They want to watch instead of do, and they also have a strong capacity to imagine. These learners usually prefer to work in groups, have broad interests in cultures and people, and more. They usually focus on concrete learning and reflective observation, wanting to observe and see the situation before diving in.

Assimilating: This learning style involves learners getting clear information. These learners prefer concepts and abstracts to people, and explore using analytic models. These learners focus on abstract conceptualization and reflective observation in the experiential learning style.

Converging: Converging learners solve problems. They apply what they've learned to practical issues, and prefer technical tasks. They are also known to experiment with new ideas, and their learning focuses on abstract conceptualization and active experimentation.

Accommodating: These learners prefer practicality. They enjoy new challenges and use intuition to help solve problems. These learners utilize concrete learning and active experimentation when they learn.

Connectivism Learning Theory.

"Knowledge has many authors, knowledge has many facets, it looks different to each person, and it changes moment to moment. A piece of knowledge isn't a description of something, it is a way of relating to something." **– Stephen Downes**

Connectivism is a relatively new learning theory that suggests students should combine thoughts, theories, and general information in a useful manner. It accepts that technology is a major part of the learning process and that our constant connectedness gives us opportunities to make choices about our learning. It also promotes group collaboration and discussion, allowing for different viewpoints and perspectives when it comes to decision-making, problem-solving, and making sense of information. Connectivism promotes learning that happens outside of an individual, such as through social media, online networks, blogs, or information databases.

1.2 Significance & need of the study

Rationale of the study:

School environment has a strict code of conduct, they believe that students learn better when they are seated in quiet rows, receiving teacher-directed instruction, rather than working with one another. Students can share their ideas with the class as a whole; however, sharing and learning with partners are comparatively very less encouraged in schools.

Schools today need to reposition the education system in a way that can develop rationally literate future citizens who uses critical thinking in their learning and understanding

The Researcher has understood that there was a crucial need to understand and provide multiple ways of Learning and teaching so the future students may have success and achieve great results in their academics.

Teachers can act as a facilitator and encourage the class to develop higher order thinking skills and increases their understanding of the concept more deeply

Peer learning showcases students' ability to apply valuable organizational skills. These include researching, planning, and making decisions.

Peer learning can prompt a sense of responsibility for one's own and others' learning and development of increased confidence and self-esteem through engaging.

Therefore, the things students learn about that topic stay in their memory longer as well. Peer learning encourages students to direct their own learning (with guidance). Students develop perseverance through hard work and in-depth research. They also learn to manage setbacks and obstacles.

The teachers mostly used traditional approaches such as lecture, narrative, and discussion. In light of these considerations, it was determined that a new approach to the teaching of the science subject is required.

The researcher believed that using Peer learning scenarios may be used more successfully to engage all students and improve assimilation of the subject by all students in the class, as well as to generate a sense of achievement and engagement among the students.

With all of the research supporting Peer learning, the researcher planned to shift the teaching focus to student-directed lessons with hopes of building student success in learning and increasing motivation in overall academics. Mrs Pooja Birwatkar, coordinator of MEd, has supported the researcher to full extent to conduct this study and enable each aspiring teacher to adopt this method of peer learning and peer evaluation for overall achievement in lifelong learning.

1.2.1 Significance and need of the study

For the students:

Research on using Peer Learning and evaluation scenarios has shown that it increases student interest and motivation, improves the development of their higher order thinking skills and increases their understanding of the concept more deeply. It requires students to use higher order thinking (Bloom, 1980, and Krathwohl and Anderson, 2001) to evaluate, analyze and synthesize information to address the issue under discussion, rather than a focus on recall of definitions or rote memorization of the concepts. Employers are looking for people with skills such as decision making, negotiating, oral and written

communication, self-awareness, and teamwork, which are cultivated as students work through Learning and involving themselves with their peers. Students are exposed to multiple perspectives and are able to develop their own position which prepares them to tackle the issues that they will face in the world outside of the formal school environment (Sadler and Zeidler, 2004).

For the Teachers:

There is a paradigm shift from traditional teachers teaching to student centered learning and teaching. These days teachers encourage student-centered learning by allowing students to share in decisions, believing in their capacity to lead, and remembering how it feels to learn.The teacher is still the classroom authority figure but functions as more of a coach or facilitator as students embrace a more active and collaborative role in their own learning

Since Peer learning and evaluation demands open-ended and student-directed inquiry, the teacher must take on the role of a facilitator. As teachers become more informed in their pedagogical practices, they are more likely to incorporate students centred learning into their teachings, and provide innovative learning opportunities for their students.

For the School Authority

Schools today need to reposition education system in a way that can develop rationally literate future citizens who uses critical thinking in their learning and understanding. Students must be encouraged in their learning by thinking, discussing, investigating, and creating. In class, students practice skills, solve problems, struggle with complex questions, make decisions, propose solutions, and explain ideas in their own words through writing and discussion. Peer learning can prompt a sense of responsibility for one's own and others' learning and development of increased confidence and self-esteem through engaging. Working with others peer learning can provide opportunities for deep engagement in the learning process, A pertinent move to prepare the country's workforce for the future needs of a knowledge economy.

For the Curriculum Developer:

Teachers are co-developers of curriculum today and the inclusion of child centeredlearning into the curriculum can engage students to be a citizens for a meaningful and productive life, so that they will build up to have a more constructive and reasonable knowledge at place.

1.3 Statement of the Problem

The title of the study is as follows:

"A Study of the Impact of Peer Learning Scenario from the perspective of Student Achievement and Peer Evaluation".

Problem Statement

The research intends to evaluate Peer Learning Scenario in terms of how they impact student's subject achievement as well as how peers evaluate such peer learning scenarios

As researches carried out in the field of pedagogy and psychology has proved beyond doubt that no two classrooms or two students are alike.

The traditional methods which depend largely on lecturing and rote learning reduce the learning of Science as a subject leading to mechanical memorization and thereby miserably failing to develop the required competencies among the students. Therefore, there needs to be a shift in the paradigm of teaching-learning process and thus the effectiveness of using Peer Learning and evaluating becomes relevant.

1.4 Aims and Objectives of the Study

1.4.1 Aim of the Study

1. To evaluate peer learning scenarios in terms of their impact onstudent's subject achievement

2. To understand how peers evaluate Peer Learning Scenarios

3. To overall evaluate the effectiveness of peer learning scenarios

1.4.2. Objectives of the Study

1. To compare the post-test science achievement scores of experimental and control group
2. To evaluate the effectiveness of peer learning scenarios as perceived by peers
3. To understand the effectiveness of peer learning scenarios

1.5 Hypothesis and Research Questions

In pursuit of the objective, the following hypothesis was formulated:

H_O1: There is no significant difference in the post-test scienceachievement scores of experimental and control groups

1.5.1 Research Questions

1. How do peers perceive peer learning scenarios?

2. What are the specific challenges of peer learning scenarios?

3. What kind of impact is created by peer learning scenarios?

4. How effective is peer learning scenarios?

1.6 Variables of the Research

The title of the research problem, the objectives of the study, the investigative questions and the hypothesis consist of concepts known as variables. These variables should be precisely defined. This is an important step in the formulation of the research problem. It is the definition of the variables that determines the information needs of the study. Therefore precise definition of variables is essential for planning the subsequent steps in the research process.

- **Independent Variable**: Peer Learning Scenarios
- **Dependent Variable:** Student Achievement

1.7 Definition of Key Terms

1.7.1 Conceptual Definition of Key Terms

The conceptual definition is considered to be the scientific text book definition of a variable. It is used to describe the theoretical ideas and research findings to others in the field.

- ❖ **Peer learning Scenarios:** Students learning from and with each other in both formal and informal ways'
- ❖ **Peer Evaluation:** Refers to the many ways in which students can share their creative work with peers for constructive feedback, and then use this feedback to revise and improve their work.
- ❖ **Achievement:** It refers to a thing done successfully with effort, skill, or courageAlso, the process or fact of achieving something.

1.7.2 Operational Definition of Key Terms

The operational definition is a quantification of a nominal definition, i.e. it is a definition in terms of specific measuring or testing criteria or operations. This definition specifies the operations which

observe, measure and record the phenomenon symbolized by the concept. Operational definitions concretize the intended meaning of a concept in relation to a specific study and provide some criteria for empirical existence of that concept (Frankfurt-Nachmias and Nachmias, 1996).

- **Peer learning Scenarios-** in this research peer learning scenarios are those which comprise of peer presentations and peer teaching
- **Peer Evaluation -** in this research peer evaluation will be done by taking interviews of the peers regarding their perception about their peer presentations and also regarding the specific challenges encountered by them while planning and executing peer teachin**g.**
- **Achievement-** in this research achievement is evaluated in terms of an achievement test created by the researcher in some selected topics of science which were taken for peer presentations.

1.8 Scope and Delimitations of the Study

1.8.1 Scope of the Research

- **Policy Makers:** This research will help the policy makers in inculcating peer learning ideas in teacher education, also encompassing various student centric teaching and learning in school and state level
- **Curriculum Developers :**This research will help the Developers to include various self learning concepts and group activities in their books so published
- **Teachers:** This research will help the teacher to act as a facilitator or a partner in the learning process of the children
- **Students:** This research will help the students to be independent learners, can choice their pattern of learning and understanding. And explore ways to discover the inner strength

1.8.2 Delimitations of the Research

The study is delimited in terms of

- **Geographical Delimitation:** The present study is limited to only one SSC board school of Mumbai district

- **Sample Delimitation**: The study is delimited in terms of considering only secondary students preferably grade 7

- **Tool Delimitation:** Tools of research will be in English and will be made by the researcher only

- The study is delimited in terms of considering only few selected topics in science subject

Conclusion

Since students has always being at the centre stage. Today's student is mature and informed, learns differently, learns while working, learns throughout life, and expects flexibility. Also, as industries recalibrate and adapt to digital, socioeconomic, ecological, and demographic drivers of change, most occupations and job roles are undergoing a fundamental transformation. Thus teachers encourage student-centered learning by allowing students to share in decisions, believing in their capacity to lead, and remembering how it feels to learn and becomes even more imperative in all circumstances. Chapter 1 presented the background for this study, specified the problem and described the significance of that problem. The first chapter concluded by stating some of the specific delimitations contained within the study. A review of the related literature will be presented in Chapter 2.

CHAPTER 2

Review of Related Literature

CHAPTER 2

Review of Related Literature

2.1 Importance of a Literature Review

A literature review is simple summary of key sources. In the study of human behavior(Socialscience), a literature review usually has an organizational pattern and combines both summary and synthesis. A summary is a recap of the important information of the source, but a synthesis is a re-organizationof that information in a way that informs how you are planning to investigate a research problem. So, we can say Literature review gives us a new interpretation of old material or combine new with old interpretations. A review of prior, relevant literature facilitates theory development. Ittraces the intellectual progression of the field, including major debates. It also evaluates the sources and advise the reader on the most pertinent or relevant research, usually in the conclusion of a literature review,It identify where gaps exist in how a problem has been researched to date. This is why literature reviews have long played a decisive role in scholarship.

Consequently, it represents an essential first step and foundation when undertaking a research project by seeking to uncover the sources relevant to a topic under study and, thus, making a vital contribution to the relevance and rigour of research: on the one hand, relevance is improved by avoiding the reinvestigation of what is already known. On the other hand, rigour is derived from an effective use of the existing knowledge base. Hence, it is undisputed that literature reviews generally play a central role in scholarship.

2.2 The purpose of a literature review is to:

Literature review provides foundation of knowledge on the particular topic, itidentifies areas of prior scholarship to prevent duplication and give credit to other researchers. It identifies gaps in research, conflicts in previous studies, open questions left from other research. It also identifies need for additional research (justifying your research). Literature review identify the relationship of works in context of its contribution to the topic and to other works

2.3 Researches on Presentation-based Learning And Peer Evaluation

In this section the researcher has tried to include studies conducted on Presentation-based Learning And Peer Evaluation with respect to different variables, which gave the researcher an insight into various probable correlates of presentation based teaching and learning on overall achievement scores of the students. In the studies given below, Presentation based learning is related to Academic Achievement or how through Classroom Peer Feedback learning has improved or understand The Effect of Peer Teaching on specific subject on Academic Achievement, Comparison Of Student Performance, Student Perception, And Teacher Satisfaction With Traditional Versus Flipped Classroom Models, also how oral presentation skills can be related to self-regulated learning have been studied to take the research forward.

2.3.1 Studies Conducted Abroad

Liu, C. et al (2020) studied, "Effects of peer learning on learning performance, motivation, and attitude", This study aims to propose a peer-learning teaching approach in a financial management course to assist students in discussing and learning in small groups as well as in engaging in games and tournaments to achieve their learning goals. The results shows that the peer-learning group outperforms the lecture-based group in both final exam scores and semester grades. These findings also reveal that the peer-learning group reports a marginally significant higher score for learning motivation and a more positive attitude toward peer learning than the lecture-based group. Participants' qualitative feedback highlights that peer learning is the most helpful feature in enhancing students' overall learning.

Ashlame, A.P.Iwanger et al (2019) studied, " Comparative effects of peer tutoring and explicit instructional strategies on science and technical college students' Achievement and Retention in Nasarawa state, Nigeria." The aim of the study is Peer Tutoring and Explicit instructional strategies had significant effect on Science and Technical College students' achievement and retention. The result indicated that the increase in students' achievement and retention scores could probably be because they were excited to have acted like teachers and given opportunities to teach and learn among their peer groups. Apparently,

teaching, instructing, demonstrating and presenting instructions like their teachers promoted their interest to learn

Sugeng, B. & Suryani, A. et al (2019), studied, "Presentation-based Learning And Peer Evaluation To Enhance Active Learning And Self-confidence In Financial Management Classroom." The purpose of this study is to identify an effective learning strategy for students to engage authentically in their learning process. This study also aims to introduce an innovative active learning approach. This is intended to enhance students' involvement and to strengthen self-confidence throughout their learning in the Financial Management class. the approach involves the adoption of structured and accountable presentation-based learning activities. The results indicate that the approach adopted in this research reasonably enabled students to be actively engaged in their learning process and nullified free-riding learning behavior among them. It also provided a chance to students to exercise their self-regulated learning towards a more independent learner and increased their confidence to speak and participate in the class forum. The results of this research contribute to the improvement of teaching practice in higher education particularly in the Financial Management course. The results imply that providing some freedom for students to creatively design and be accountable for their own learning has great potential of enhancing their authentic active learning and confidence

Mičínová, I. et.al. (2019) Improving Student Academic Presentation Skills In English Through Classroom Peer Feedback – Case Study In The Context Of Higher Education." This study explores the impact of formative peer feedback on the development of academic presentation skills in English among students of the humanities and social sciences. The aim of the course project was to test an alternative format of academic presentation, the so-called Three Minute Presentation. It mainly drew attention to traditional beginner problems such as the lack of clarity and impact, as well as their struggle with anxiety and controlling their oral production. The project employed elements of autonomous learning and formative peer feedback in order to increase student engagement and enhance opportunities for spontaneous speaking. The results indicate that this mixture of pedagogical arrangements provides multiple ways for students to practice their presentations. Taking part in its assessment is seen as a precursor for improving their performances, inasmuch as their previous secondary school experience had not been developed properly enough.

Williamson. S et al. (2018) studied "The Impact of Peer Learning within a Group of International Post-graduate Students – A Pilot Study"', this Pilot study explored and evaluated the value of peer learning with international students undertaking a post graduate research methods module. The aim was to develop a

sound knowledge base on research methodologies as well as developing the students learning skills which are transferrable and applicable to any learning environment. The key findings were that the students benefitted from the use of peer learning and were successful in achieving the learning outcomes. As the circumstances at the time had a potential impact on the performance of these students, the study will need to be repeated with the subsequent groups. Another aim would be to see if there is a real impact on self-directed learning when using the peer learning approach in the classroom. Despite these hurdles the overall performance was good. The effectiveness of the social learning theory has been recognised within the results of the students overall performance.

Braun, **M.** et. al (2017), Studied " Comparative Evaluation of Online and In-Class Student Team Presentations". In this study, the two modes of presentation were compared in terms of student perceptions and academic performance. A survey probed students' familiarity with digital technology, presentation anxiety, and differential perceptions of the two modes. Aside from a confirmation bias, no significant difference was found between those who presented in class and online. In a notable exception, a clear asymmetry appeared when students were asked to choose a mode for a future presentation: none of the online presenters opted for the in-class mode while a third of in-class presenters selected the online mode. Presentation anxiety was similar for in-class and online presenters and was insensitive to gender and familiarity with English. No significant difference was detected between the modes in terms of academic performance.

Tsang, A. et al**.** (2017) studied, "Enhancing learners' awareness of oral presentation (delivery) skills in the context of self-regulated learning." The purpose of this study was to investigate Presentations play a role in students' acquisition of knowledge. The study was set in the context of promoting self-regulated learning. It implies, awareness enhancement is the first and foremost step towards learner autonomy and active learning. The study has demonstrated the fruitfulness of co-constructing learning and assessment materials in classrooms. It also supports how teachers play an imperative role in facilitating learners' development, especially in searching for specific directions of learning, that is, the specific items in this study. The promotion of learners' autonomy does not denote letting learners do all the work alone, without input from faculty; rather, teachers are required to assist in an autonomy-supportive fashion.

Unal, Z.et al. (2017) studied, "Comparison of Student Performance, Student Perception, and Teacher Satisfaction with Traditional versus Flipped Classroom Models." This study investigates how using the flipped teaching model affects student performance, perceptions, and teacher satisfaction in comparison to the traditional model. Sixteen teachers implemented the flipped teaching model in their classrooms and

reported the results of the flipped teaching model for the first time. Pretests and posttests were used to measure and compare student performance while student and teacher surveys facilitated data collection on student perception and teacher satisfaction. The results of the study showed that, in most cases, the flipped classroom model demonstrated higher student learning gains, more positive student perception, and higher teacher satisfaction compared to the traditional model. This study adds evidence to the current literature that, if the conditions are properly set, the flipped classroom should have the potential to be an extremely effective learning style.

Abdelkarim, R. et al. (2016) studied, "The Effect of Peer Teaching on Mathematics Academic Achievement of the Undergraduate Students in Oman." This study contributes considerably to the psychological and educational research in the field of the pedagogy of college mathematics. The outcome shows that peer tutoring is an effective way to assist math teachers, it will encourage faculty to take advantage of the mutual benefits that occur when students teach other. Findings and recommendations of this study provide insight into how a group of Dhofar University students perceives themselves as mathematics learners. The results of the study helped instructors, administrators, and even policy makers who endeavor to develop the teaching- learning process and classroom environments.

Girard,T. et al. (2016) studied, "An Exploratory Study of Class Presentations and Peer Evaluations: Do Students Perceive the Benefits" This study examines students perceptions of how class presentations and peer evaluations contribute to their learning and skill-building, and whether their perceptions significantly differ by gender. The data were collected from marketing students at two universities in the United States. This study found that students generally perceive that class presentations contribute to their learning and skill-building. The results indicate that students seem to benefit from peer-evaluations through more active engagement in class presentations

Aisha Fadl Al-kaabi et al. (2016) studied, "Effects of Collaborative Learning on the Achievement of Students with Different Learning Styles at Qatar University (QU)." This study examines that Learning styles have a significant effect on the post-test, midterm and final exam scores of students learning collaboratively with the same learning style in a blended learning environment. Differences in learning style had no significant effect on the achievements of collaborative learners in the exercises, proposal writing and poster task, or in the pre-exam. Moreover, there was a significant difference in the students' pre, midterm and final exam scores in a blended learning environment due to learning style where collaborative learning did not occur. Students with an assimilating learning style did significantly better in these exams. However, significant differences were found in the students' scores for their exercises,

proposal and poster tasks or for their post exam due to learning style where students had not learned collaboratively. Finally, learning styles have no significant effect on the students' achievement (scores for the exercises, proposal and poster task, and for the pre, post, midterm and final exam) in a blended learning environment where collaborative learning had taken place.

Jibrin, A. G. Zayum, S. D. et al. (2012) studied "Effects of Peer Tutoring Instructional Method on the Academic Achievement in Biology among Secondary School Students in Zaria Metropolis, Nigeria." The purpose of this study was to investigated the effect of peer tutoring instructional method on the academic achievement in Biology among secondary school students in Zaria Metropolis, Nigeria. The design for the study was pretest and posttest experimental control group design. Two senior secondary schools were randomly selected and made into experimental and control groups. Through the results of this study, it could be seen that teachers need to use peer tutoring instructional method so as to improve the academic achievement of students in Biology. There is the need for training of biology teachers on the effective use of peer tutoring instructional method in teaching biology. Facilities should be provided by all levels of the governments as well as PTAs and NGOs for effective use of peer tutoring instructional method for teaching in senior secondary schools

Dehghani,M, Amini,M. Kojuri,J. And Nabeiei,P.et. al (2014),

studied," Evaluation of the efficacy of peer-learning method in nutrition students of Shiraz University of Medical Sciences." This study was conducted two parts: qualitative and quantitative survey. A quasi-experimental, pretest/post-test research was used in quantitative part. In this study, whole groups of undergraduate nutrition students in courses of study and learning techniques with the help of teachers held a course and took a part in a competition in 15 major subjects of study and learning methods. The study lasted for two-week sessions and whole of nutrition students were included. The results of this study confirm the results of the previous studies emphasizing numerous positive effects of the peer learning methods in the academic community. The results also suggest that peer learning is effective to enhancement of the students' confidence and learning. Peer learning also helps to develop their future responsibilities.

Miao, Y. and Koper, R. et.al (2007) studied, "An efficient and flexible technical approach to develop and deliver online peer, in this studied the researchers presents a method based on open e-learning standards to script peer assessment processes. A standard-compatible tool can help users to script various forms of peer assessment in a machine-interpretable form. Such peer assessment scripts then can be executed on today's open technical e-learning infrastructure. In comparison with typical software development approaches to support online peer assessment, this technical approach is more efficient and flexible.

Levy, D. et. Al (2008), studied, "Peer Effects and Alcohol Use among College Students." study examines the extent to which college students who drink alcohol influence their peers. We exploit a natural experiment in which students at a large state university were randomly assigned roommates through a lottery system. We find that on average, males assigned to roommates who reported drinking in the year prior to entering college had a Grade Point Average (GPA) one quarter-point lower than those assigned to nondrinking roommates. The effect of initial assignment to a drinking roommate persists into the second year of college and possibly grows. The effect is especially large for students who drank alcohol themselves in the year prior to college. In contrast to the males, females' GPAs do not appear affected by roommates' drinking prior to college. Furthermore, students' college GPA is not significantly affected by roommates' high school grades, admission test scores, or family background. These findings are more consistent with models in which peers change people's preferences than with models in which peers change people's choice sets. Surprisingly, the policy of segregating drinkers by having substance-free housing could potentially lower average GPA in the university.

Fuchs.D. and Fuchs.et.al (2005), conducted research in Peer-Assisted Learning Strategies (PALS) were applied and attempted to promote fluency, word recognition and reading comprehension in young school-age children. Douglas and Lynn Fuchs created the PALS program which was intended to pair students according to skill level and work on math, reading and spelling class work, at the elementary level. This idea was derived from the class wide peer tutoring program (CWPT), created by Delquadri, Greenwood, Whorton, Carta, and Hall (as cited in McMaster, Fuchs and Fuchs, 2006). The use of PALS and CWPT program allowed enabled teachers to double learning time by having students simultaneously work on academic tasks. Fuchs and Fuchs (2005) chose this method based on prior research which noted that "PALS is to strengthen the teachers' capacity to meet the academic needs of a broader range of children". Researchers examined peer mediated instruction as a means to support learning within students in grades two through six. Students were assigned to work together in pairs, combining one student from a lower performing and higher performing class. Performance was identified by the school prior to the onset of this study. Each session included three activities using PALS; partner reading (students reading text to one

another for five-minute periods), paragraph shrinking (students reading one paragraph at a time while identifying the main idea) and prediction relay (reading larger chunks of the text, requiring students to make predictions) (Fuchs and Fuchs, 2005). As a result of this study, Fuchs and Fuchs (2005) identified PALS to be practical enough to include in everyday classroom routine. In addition to this finding, the researchers concluded that PALS alone increased improvement in word recognition, spelling, and general reading skills. These researchers provided greater evidence that children in the primary grades, improved in reading skills when paired with another student in a cooperative learning structure

2.3.2 Study Conducted in India

Chandra. R et al. (2015) studied, " Collaborative Learning for Educational Achievement". the concept of collaborative learning by presenting and analyzing the educational benefits of Collaborative learning techniques. Collaborative learning is more students centered. The collaborative tradition takes a more qualitative approach, analysing student talk in response to a piece of literature. This paper clarifies the differences between collaborative and individual learning. . The paper also highlights teacher's perspective for individual and collaborative learning. The paper concludes with a discussion about the implications of these issues with respect to achievement of undergraduate students in English. T-test is used to study the difference in means in achievement in English by using collaborative learning and individual learning. The sample comprises of 40 students (males 30, females 10) of undergraduate program. Purposive sampling has been used.

Sen. A. Goutam, P. and Chatterjee,C. et al.(2012) conducted a study on, "Peer Effects in Graduate Education: Evidence from India". this study the impact of exogenously assigned peer groups on the academic performance of MBA students at a leading Indian graduate business school. The study examine the impact of peer academic ability (performance in the school's standardized entrance examination), gender, caste and undergraduate background (degree from an elite engineering institution). All peer variables are highly significant at the dormitory level. Fewer peer variables are significant at the academic section level. The study finds that proportion of higher caste students in the peer group has a significant positive impact on lower caste (Scheduled Caste and Schedule Tribe) students at both academic section and dormitory levels. Proportion of peers with a degree from an elite engineering institution has a significant

positive impact on students from regular undergraduate institutions at the dormitory level. Also, proportion of females in the peer group has a positive impact on the performance of male students at the dormitory level.

2.4 An Afterword

The review of related literature enabled the researcher to develop a deeper understanding of the present research. It called attention to areas that had been thoroughly investigated previously and areas that had been hitherto overlooked. Thus, it provided a compelling basis for the present study.

After a lengthy perusal of the related studies, the researcher could draw the following conclusions:

- The review of literature reveals that extensive research(abroad) conducted over the past decade supports the efficacy of engaging students in Peer Learning scenarios as a means of supporting a variety of desired learning outcomes including Active learning, teamwork ,interest in and motivation to learn the desired topics, enhancing learners awareness, reflective judgment and ethical decision-making.

- Peer Learning have also been examined as the acquisition of knowledge and skill through active helping and supporting among status equals or matched companions..

- There have also been a number of studies that have emphasized how the Peer learning framework goes beyond the basic teaching and learning with its explicit attention to peer appraisal, peer assessment, peer correction, peer feedback, peer learning, peer marking, peer rating or peer review

- Another area that has been the focus of research is teacher beliefs vis-à-vis peer learning and feedback and how they impact classroom instruction.

- There are a few studies that have attempted to highlight the factors that impede as well as facilitate the incorporation of Peer learning and feedback into the classrooms.

- ❖ Instructional frameworks for peer learning and teaching including pedagogical choices and classroom environment have been the focus of a few studies.

Conclusion

This literature review has found a wealth of information on the existing peer review systems. The literature presented here demonstrates that there is overwhelming acceptance of Peer learning among researchers and educational organisations, however this strategy has not been very frequently in science. It has also looked at the teacher's perspective and found discussions on what constitutes good practice and how effective it can be. Consideration of the timing of assessment, how to implement it and possible problems with student ability have also been reviewed. One of the benefits that has been noted for the teacher is that there is possible time saving. From the student perspective one possible benefit of peer assessment is that it may increase a sense of community and so reduce isolation. Other benefits that have been found in the literature include the possibility that peer review encourages students to be more critical of their work; it improves motivation and it potentially gives the students a better understanding of the learning process. Drawbacks for the student have been suggested to be, the problem that they lack the skills needed to give effective feedback, and they may have a fear of giving negative feedback. There is also an issue with a lack of time for students and this may be exacerbated if they need to learn new systems.

Hence, the researcher has tried to fill this lacuna by attempting to study the impact of Peer Learning scenario from the perspective of Student Achievement and Peer Evaluation

CHAPTER 3

RESEARCH DESIGN

CHAPTER 3

Research Design

3.1 Defining the Beginning

The onerous task that follows one of defining the research problem is the devising of the blueprint of the research project, popularly known as the “research design”. A research design focuses on the end-product and all the steps in the process to achieve that outcome. In this sense, a research design is viewed as a functional plan in which certain research methods and procedures are linked together to acquire a reliable and valid body of data for empirically grounded analyses, conclusions and theory formulation. The research design thus provides the researcher with a clear research framework; it guides the methods, decisions and sets the basis for interpretation. Bless, Higson-Smith and Kagee (2006) define research design as “operations to be performed, in order to test a specific hypothesis under a given condition”.

Consequently, research design can be thought of as the logic or master plan of a research that throws light on how the study is to be conducted. It shows how all of the major parts of the research study– the samples or groups, measures, treatments or programs – work together in an attempt to address the research questions. According to Mouton (1996) the research design serves to "plan, structure and execute" the research to maximize the "validity of the findings". It gives directions from the underlying philosophical assumptions to research design, and data collection. Yin (2003) adds further that “colloquially a research design is an action plan for getting from here to there, where ‘here’ may be defined as the initial set of questions to be answered and ‘there’ is some set of answers”.

Intelligent research unquestionably requires considerable attention to planning and design, perhaps evocative of the carpenter's adage: "measure twice, cut once!" A research design is a plan of detailed instructions based on scientific principles and rules of evidence, which guide the researcher to collect and analyze the data in a manner that eventually results in answers to specified research questions. Research design is also a process of transition, which transforms knowledge from theory to practicality. Research aims are materialized by selecting an appropriate study type and instruments, implementation through data collection and, ultimately by drawing inferences on the basis of properly planned analysis. While one could conduct research without organized effort and a blueprint, this would be analogous to the driver who would attempt to reach a destination in the least possible time without a map.

To put it simply, a research design is a logical and systematic plan prepared for directing a research study. It specifies the objectives of the study, the methodology and the techniques to be adopted for achieving those objectives. The research design, thus, provides a systematic plan of procedures for the researcher to abide by.

3.2 Methodology of Research

Research approaches are plans and the procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation. The overall decision involves which approach should be used to study the topic. Informing this decision are the philosophical assumptions the researcher brings to the study; procedures of inquiry or research designs and specific research methods of data collection, analysis, and interpretation. The selection of a research approach is predominantly based on the nature of the research problem or issue being addressed.

The present research has used mixed method design which allows the researcher to establish a relationship between the independent variable and the dependent variables. Here, the researcher deliberately manipulated the "Peer Learning scenario which is an independent variable and observed how it affected the total students achievement in the post test (dependent variables) of the chosen students

Research Design- Mixed method Design

Quant- Qual ➡ data interpretation

Quantitative- Quasi Experimental Study --2 groups non-randomized subjects post-test design only

E X _____ O2

C — _____ O2

2 groups - experimental and control were selected. Post-test was taken

Qualitative -- The qualitative data was collected in terms of interviews of different groups regarding their peer presentation experience both in terms of learners and as presenters.

3.3. Population and Sample of the Study

3.3 Population

Polit and Hungler refer to the population as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications. It is the group of interest to the researcher, to which the results of the study will be generalized to. In this study, the Population was comprised of all the secondary school students from SSC board different

3.3.1 Sample

A sample is a small proportion of a population selected for observation and analysis. Therefore, the selected respondents constitute what is technically called a ‘sample’ and the selection process is called ‘sampling technique’. By observing the characteristics of the sample, one can make certain inferences about the characteristics of the population from which it is drawn. The sample of the study consist of the students of two Division of SSC Board studying in Class VII in Mumbai. The sample was selected with the help of **Purposive sampling technique**.

3.3.2 Sampling Technique

Purposive sampling, also known as availability sampling, was used in this study. The purposive sampling is a specific type of non-probability sampling method that relies on data collection from population members who are conveniently available to participate in a study.

Two groups were selected from grade 7th Std. Total of 56 students have been studied as a total sample size. 56 students were further divided into two groups consisting of 28 each. One was experimental group, the other was control group. 7th STD Div A consisting of 28 students were considered as an experimental group. Experimental group was further divided into 8 small groups on a convenience basis and were asked to make PPT presentations and do peer teaching in the class. Participants reported that they never used a Peer teaching model for instruction before the experiment

Control group on the other hand was Div B of Class 7th std, consisting of 28 students each. They were given the learning with teacher instructed method or traditional method of teaching

3.4 Variables of the Study

Independent variable: The independent variable lies at the heart of any quantitative experimental design**.**This variable is isolated from any other factor, allowing experimental manipulation to establish analyzable results.

In the present research, Peer learning scenarios is the independent variable. The researcher used Peer learning scenarios as the basis for argumentation and discussion.

Dependent variable: These variables are expected to change as a result of an experimental manipulation of the independent variable.In the present research, students achievement is the dependent variables.

3.5 Tools :

Tool 1: Achievement test: Researcher has prepared only 1 post-test (achievement test) on two topics from science subject . The test comprised of both Objective as well as subjective questions consisting of subject knowledge understanding and application. This achievement tool was prepared by the researcher. Face validity and content validity of the tool was established with the help of experts. Test - Retest Reliability will be done.

Tool 2: Interview: The Interview Schedule has been prepared by the Researcher. The interview was in a Semi structured format which comprises 15 questions in the following areas

- The perception about the students presenting and doing peer teaching
- Challenges faced by the students during the experiment
- Initial reactions of the students when topic was allocated
- Division of the topic among the group members
- Learning in the process
- Group formation procedure, about the leadership process
- Medium of presenting in the class etc

Tool 3: Observation tool: The researcher has used various open ended questions before the peer learning process and after the peer learning presentation taken place and noted important points related to the attitude and feeling of the presenter**.** Also noted the reaction of the audience looking at others presenters

3.6 Data Collection Procedure:

Depending on the nature of the information to be gathered, different instruments are used to gather data from the participants. The following instruments were used for this purpose.

- ❖ The Researcher will then be obtaining permission from the Principal of School for conducting the lessons and the research module
- ❖ Out of the two Division Of 7th standard of SSC Board School that will be used for the study, one will be assigned to the experimental group while the other will be assigned to the control group.
- ❖ For both the groups, the researcher will be selecting two topics of approximately equal difficulty level in the Science subject of Class VII and prepare the Peer teaching presentation for the same.
- ❖ Around 7 to 8 groups will be made to give the presentation on the allocated topics
- ❖ Duration will be around 30-35 minutes for each
- ❖ Later the Post test will be taken on the topics being presented
- ❖ Control group on the other hand will be Div B of Class 7th std, consisting of 28 students each. They will be getting the learning with teacher instructed method or traditional method of teaching. Control group will also be giving the post test after the teachers' teachings get done.

3.7 Data Analysis:

The data of the present study was analyzed quantitatively as well as qualitatively. The Researcher had used the following descriptive and inferential statistical techniques for data analysis and draw the conclusion.

a) <u>Quantitative Analysis of the study</u>:

3.7.1 <u>Descriptive Analysis</u> - In the present study, the following descriptive analysis will be used.

•**Measures of Central Tendency** - The measures of central tendency computed for the present study will be Mean, Median and Mode.

•**Measures of Variability** - Variability is described as the dispersion or spread of separate scores around the central tendency. The measure of variability used in the present study will be Standard Deviation.

•**Measures of Divergence from the Normality** - Measures of Divergence used in the present study will be Kurtosis and Skewness.

•**Graphical Analysis** - Frequency Polygon and Pie Diagram will be used.

•**t-test**: An independent t-test was used to determine whether there is a significant difference in the Post-test Achievement scores in science among the Upper Primary students.

b) <u>Qualitative Analysis of the study</u>:

The data will be collected through Semi-structured Interview Questionnaires prepared by the researcher and will be analyzed

- ❖ By coding the data
- ❖ Rating appropriate categorization from the team.

This will assist the analysis of the data and help in conceptualization of the findings.

3.7.2 Inferential Analysis

The concept of inference is actually the process of generalizing characteristics to a broad category of cases on the basis of knowledge of only a few cases. It involves many statistical tests which help in concluding about the hypothesis set by the researcher. Inferential analysis of the data was carried out with the help of the‘t’ test.

CHAPTER 4

DESCRIPTIVE ANALYSIS

CHAPTER 4

DESCRIPTIVE ANALYSIS

4.1 Need for Data Analysis

Dictionaries define data as factual information used as a basis for reasoning, discussion, or calculation. However, it also holds true that data may include both useful and irrelevant or redundant information and must be processed to be meaningful. Data, in the real world, is often found in such large numbers and in a variety of formats that they can be quite formidable at first glance. In order to achieve the objectives of the study, analysis of the data collected forms a crucial part of the process. Planning and organizing in research design and data collection provides a considerable assurance in quality research but the ultimate lies in the analysis.

Thus, data analysis may be thought of as a process of bringing order, structure and meaning to the mass of collected data. It is described as messy, ambiguous and time-consuming, but also as a creative and fascinating process. Broadly speaking, it is the activity of making sense of, interpreting and theorizing data that signifies a search for general statements among categories of data

Statistics is a body of mathematical techniques or processes of gathering, organizing, analyzing and interpreting numerical data. Various statistical techniques are used to draw inferences from the collected data. Considering that research yields masses of such quantitative data, statistics is a basic and valuable tool of measurement and evaluation.

Two types of statistical applications are relevant for the analysis of data:

- Descriptive Analysis
- Inferential Analysis

Descriptive statistical analysis limits generalization to the particular group of individuals observed. No conclusions are extended beyond this group and any similarity to those outside the group cannot be assumed. The data describe one group and that group only. Descriptive statistical analysis is extensively used for simple action research and provides valuable information about the nature of a particular group of individuals.

4.2 Descriptive Analysis

Descriptive analysis is essential to establish normality of the distribution of the data. This will enable the researcher to use parametric tests to test the hypothesis. The following statistical techniques are used for descriptive analysis:

- **Measures of central tendency**: This includes the mean, the median and the mode.
- **Measure of variability**: This includes standard deviation.
- **Measures of divergence from normality:** This includes skewness and kurtosis.
- Graphical representations are used to explain the data.

4.3 Descriptive Statistics of Pre-test Scores in the Socio-Scientific Issues Attitude Scale

Table 4.1: Descriptive Analysis of Post test science achievement test of Experimental group for grade 7^{th} std

Pre-test	N	Mean	Median	Mode	SD	Kurtosis	Skewness

Attitude Scale							
	28	30.107	31	40	8.33	-1.107	-0.397

Interpretation

In the post-test, the value of mean, median and mode are 30.107, 31 and 40 respectively. This indicates that the difference between mean, median and mode is marginal and hence the distribution is near normal. The skewness of the distribution is -0.397, i.e. the distribution is slightly negatively skewed. The kurtosis of the distribution is -1.107 which is below 0; hence the distribution curve of the post-test scores is Platykurtic.

Estimation of Population Parameters

This involves the computation of standard error and fiduciary limits of mean of post test scores at 0.95 and 0.99 levels of confidence.

Table 4.2: Standard Error and Fiduciary Limits of the Mean of the Post-test Scores of Experimental group of the Given Distribution

Sample size (N)	S.E. of Mean $S.E_M = 1.58$	
28	Fiduciary limits at 0.95 44.35 to	Fiduciary limits at 0.99 43.37 to

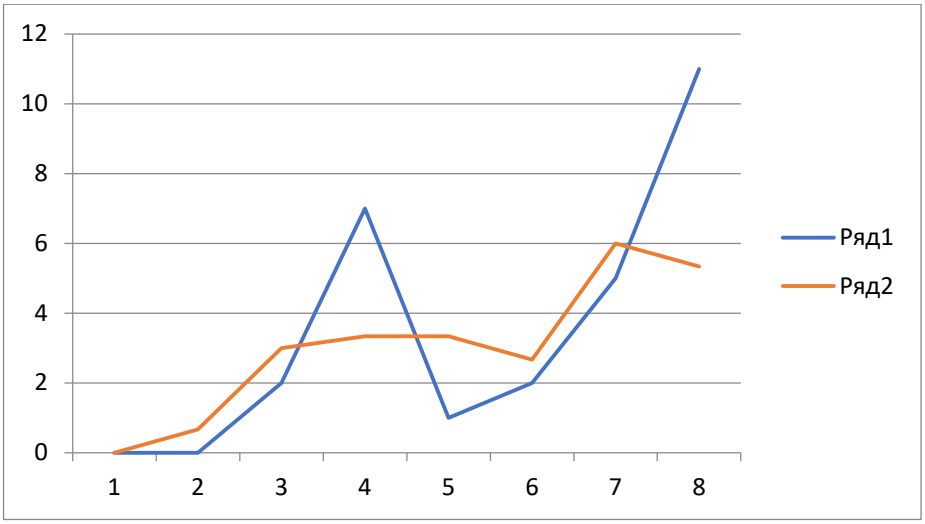
	50.52	51.50

Interpretation

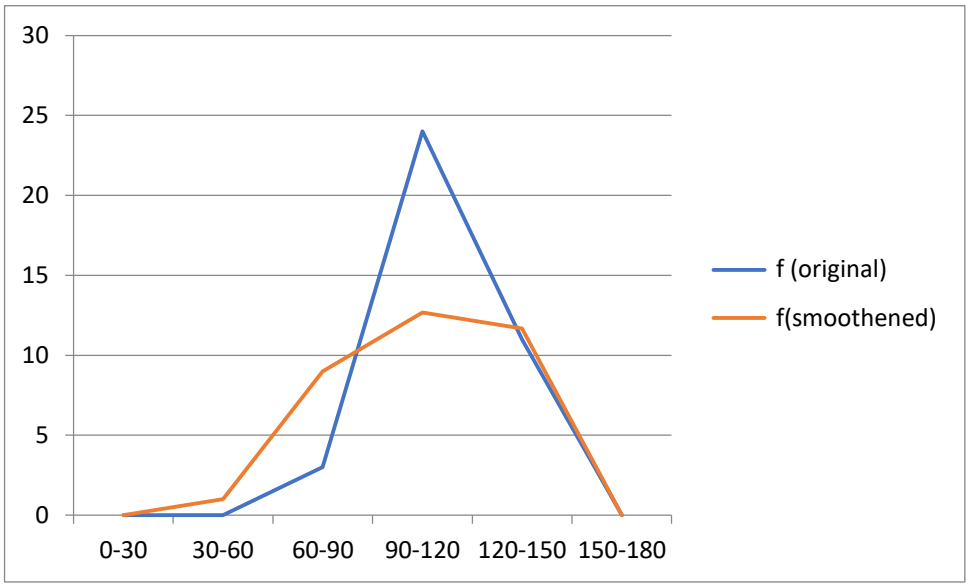
The standard error of mean for the sample before intervention is 1.58.The fiduciary limits at 0.95 are 44.35 to 50.52, which indicate that out of 100 replications of the study, the probability is that 95 times the population mean will be between 44.35 and 50.52.The fiduciary limits at 0.99 are 43.37 to 51.50, which indicate that out of 100 replications of the study, the probability is that 99 times the population mean will be between 43.37 and 51.50.

Table 4.3: Frequency Distribution Table showing Post-test Scores of Experimental group of the Given Distribution

Class Interval	F	SF
0-5	0	0.0
5-10	0	0.7
10-15	2	3.0
15-20	7	3.3
20-25	1	3.3
25-30	2	2.7
30-35	5	6.0
35-40	11	5.3



Graph 4.1: Line Smoothened Frequency Distribution of the Post-test Scores in the students achievement of the experimental group



4.4 Descriptive Statistics of Post-test Scores in Control group

Table 4.4: Descriptive Analysis of Post-test Scores of Control group of the Given Distribution

Post-test Attitude Scale	N	Mean	Mode	SD	Kurtosis	Skewness	Median
	28	24	0	12.42	-0.42	-0.69	26

Interpretation

In the post-test, the value of mean, median and mode are 24, 26 and 0 respectively. This indicates that the difference between mean, median and mode is marginal and hence the distribution is near normal. The skewness of the distribution is -0.42, i.e. the distribution is slightly negatively skewed. The kurtosis of the distribution is -0.69 which is below 0; hence the distribution curve of the pre-test scores is platykurtic.

Estimation of Population Parameters

This involves the computation of standard error and fiduciary limits of mean of post-test scores in the attitude scale at 0.95 and 0.99 levels of confidence.

Table 4.5: Standard Error and Fiduciary Limits of the Mean of the Post-test Scores of the Given Distribution

Sample size (N)	S.E. of Mean $S.E_M = 2.35$	
28	Fiduciary limits at 0.95 51.74 to 60.94	Fiduciary limits at 0.99 58.28 to 62.40

Interpretation

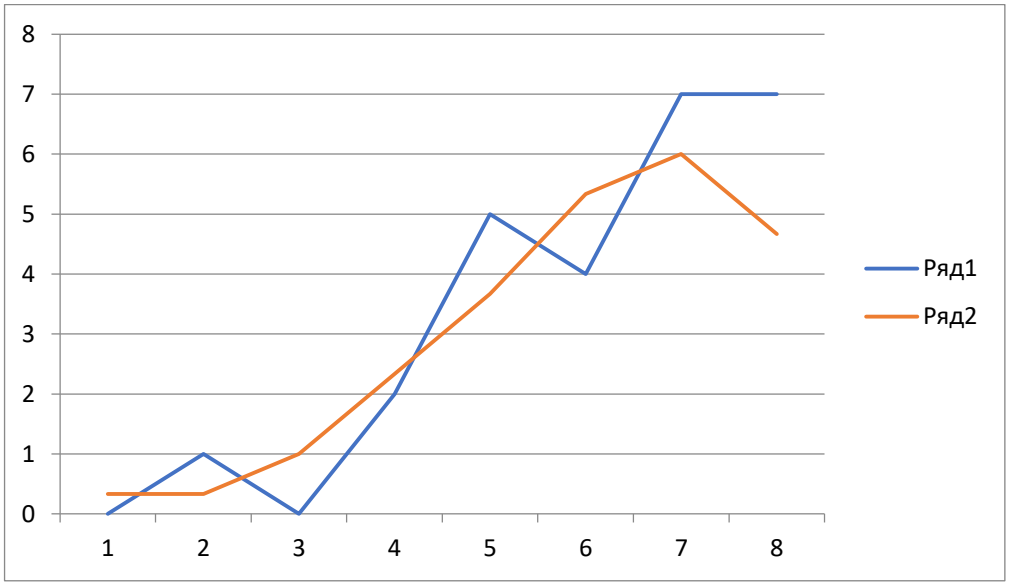
The standard error of mean for the sample after intervention is 2.35.The fiduciary limits at 0.95 are 51.74 to 60.94 which indicate that out of 100 replications of the study, the probability is that 95 times the population mean will be between 51.74 and 60.94.The fiduciary limits at 0.99 are 58.28 to 62.40, which indicate that out of 100 replications of the study, the probability is that 99 times the population mean will be between 58.28 and 62.40.

Table 4.6: Frequency Distribution Table showing Post-test Scores in the students achievement of the control group

Class Interval	**F**	**SF**
0-5	0	0.3

5-10	1	0.3
10-15	0	1.0
15-20	2	2.3
20-25	5	3.7
25-30	4	5.3
30-35	7	6.0
35-40	7	4.7

Graph 4.2: Line Smoothened Frequency Distribution of the Post-test Scores in the students achievement of the control group



4.3 Pre-presentation feedback by the experimental group of grade 7 std

1. What do students prefer, is it Presentation or teachers Teaching?

Teachers teaching	**Presentation**
Group 1	
Group 2	
Group 3	
Group 4	

Group 5	
Group 6	
Group 7	
Group 8	

When researcher had put this question to the experimental group. Researcher wanted to understand the preference of the students. Since students were initially scared to take the responsibility of doing the presentation-based learning and teaching, hence out of all eight groups who were asked about whether they prefer presentation or teachers teaching, they answered Teachers Teaching.

Group 4 has expressed, "teachers teaching is more preferred as teachers are more knowledgably and we understand better from their teaching and thus remember till the examination".

The arguments were occasionally strongly influenced by emotion. Moreover, the students were unaware that they could use presentation-based learning more effectively and enrich the learning- teaching process.

2.What was the student's initial reaction when they got to know about group presentation?

Apprehensive	**Anxiety/ Nervous**	**Ambiguity**	**surprised**	**confident**
Group 1	**Group3**	**Group1**	**Group 7**	**Group 6**
Group 5	**Group 4**			**Group 8**
	Group 2			

Students had magnitude of reactions when they were asked to present the science topic in the class. Some where Apprehensive on what is going to be the situation, who will be the group members, how the teacher is going to divide the group and what sub topics will be allocated to them, group 1 has expressed, "will I be having good intelligent students in my group so that my group will win."

Some group members were nervous while others were surprised as the situation is for the first time in front of them, while group 6 and group 8 were confident in knowing that they are going for the presentation of the said topic of science. Group 7 member had clearly expressed, " we all have only one goal to be confident and perform good in the class."

Excited	Scared	Shocked	Normal
Group1	Group 3	Group 2	Group 4
Group 8	Group 5	Group 7	Group 6

3.Were the students excited or scared?

When asked, whether the students are excited or scared with the news of presentation, majority of them expressed they were either scared or shocked. While group 1 and Group 8 were very excited. They mentioned that they are confident and they can do it

4.How did the students divide the work?

Randomly / Equally	As per the expertise
Group 1	Group 3
Group 2	Group 4
Group 5	Group 7
Group 6	
Group 8	

When students were asked regarding division of the group members, 5 out of 8 groups responded that groups were divided equally on the basis of random division of work. Group 2 expressed, “one will make ppt, one will make activity and one will do the experimentation.” Group 6 expressed, “each one involved in making ppt, learning together and making strategies to explain in the class. “Where other three groups said they divided the group as per expertise, group 3 member expressed, “in break we used to sit and according to each expertise we have divided.”

5.Are all group members adjusted?

Yes	No
Group 1	
Group 2	
Group 3	
Group 4	
Group 5	
Group 6	
Group 7	

Group 8	

When Students were asked regarding adjustment of the group members, all 8 groups members expressed they are happy and they were quite comfortably adjusted to the all the group members

6.What do you think should we involve teachers in the presentation or will it be managed easily by you all?

Yes	**No**
	Group 1
	Group 2
	Group 3
	Group 4
	Group 5
	Group 6
	Group 7
	Group 8

When students were given the situation to take a help from their science teacher during the presentation learning process, they expressed they will be able manage everything by themselves and learn during the process. And thus, no teacher involvement was required.

7.What do you think about the size of the group?

Sufficient	**Less**	**More**
Group 1		
Group 2		
Group 3		
Group 4		
Group 5		
Group 6		
Group 7		
Group 8		

When asked regarding the size of the group members, every group expressed it was sufficient and they were quite happy with the size of the group members. Group 7 expressed, “we were 4 members and we all were good with the groups we have got.”

8.What do you feel about learning in the process?

Technology	Team Building/ bonding	Learning how to explain	Building confidence to present infront of class	Finding leader in ourselves
Group 1	Group 4	Group 5	Group 3	Group 6
Group 2		Group 7		
		Group 8		

When students were asked regarding there learning in the process of peer learning and preparing for the presentation, there were multiple answers to this, some expressed, they made new friends, some said we got acquainted with new technological tools, some expressed building up the confidence while some said they found leaders in themselves Group 6 expressed, " Learning was – how to make PPT, we found a leader in ourselves, and we were happy with the right instructions of the leaders, there was teamwork.", Group 4 members said we created good bonding , " we went to each other's home, did teamwork , made ppt and had fun."

4.4 Students Post presentation feedback by the experimental group of grade 7 std

1. How was the experience of the entire peer teaching presentation?

Researcher tried understanding the experience of peer teaching student had, while asking the respond researcher received was that students enjoyed every bit of it , students expressed, that initially they were nervous but as and when the time progressed, they started exploring ways of making the best learning and teaching experience. They learnt the art of explaining others. Clearing the doubts of audience. Some said learning technology was more fun. As they explored new mediums of animations.

2. Are you satisfied with your presentation?

When researched asked about their satisfaction with there performance, some expressed they were nervous and scared and so the result of performance did not turn our to be that good. Some expressed there

satisfaction as good but claimed that given an opportunity they will do much better in future with the experience they gathered here

3. Do you think next time also we must do the presentation method for teaching and learning?

Majority of the Students expressed they will definitely prefer presentation method, by saying this they exclaimed, “It helps us to learn more and explore things deeper.” Group 4 said “I went deep into google search and found learning in my way of understanding and tried explaining the same to my audience so that others students also understands better .” while group 8 said no to presentation , they will prefer teachers teaching more .

4. Will the peer presentation be much better next time?

When asked regarding there future peer presentation performance, each group members expressed they will give their best next time as they now know what were there flaws and knows how not to repeat the same mistakes in future presentation.

5. Now do you still require teacher’s explanation or you all have understood from your peers?

After the presentation taken place, researcher tried to understood from students whether still they require teachers teaching. Majority of the students expressed, they do not require teachers teaching now. They understood the concepts and were able to write in exam if given a test.

6. What do you think others have learnt from you?

When researcher had put this question to the students, Group 7 members expressed, “our group was the best in explanations, others will definitely remember till the examination. One of the members of Group5 said other pupil of the class has definitely learn the theories which we tried explaining.

Over all students expressed, that others have definitely learnt from groups both what they have explained and what mistakes should not be done while explaining.

7. **What is your experience from others group?**

Students observed other peer during the presentation. Experimental Groups had expressed that they learnt many does and don'ts, group 6 members said," students were not nervous they have made there ppt slides also attractive and simple to explain. We must learn from them."
Group 2 members said, : I saw a great bonding developed into the groups there were good coordination. Topic allocation was also done nicely ".

8. **What do you think went wrong during this presentation?**

When researcher had put this question to each participant of the experimental group, the members of the group expressed, that since it was their first time, they have taken it towards the lighter side. In future presentation students will make sure they are well prepared to explain as well as tackle the queries of the student.
Group 7 mention," we were not confident enough, we all were nervous to present in front of the class."
Group 6 mentioned, "we think we would have explained more deeply and better, we were more like reading the slides."
Overall group members felt they could do much better. And hence they ill try to make it possible to do better in the future presentation

9. **If given a test, will you all be ready for the same?**

When researcher had put this question to each participant of the experimental group. The students expressed " YES". They mentioned they are ready and they no more required teachers explanation. Because they can easily approach their peers if they are unable to understand something. Group 7 mentioned, " peer are easily approachable, and more helpful".
Group 5 member mentioned, " when our test is going to be conducted we know whom to approach for better explanation".

Conclusion

Students in the experimental group who have experienced peer learning have made an impact in their overall view towards taking the study in the most enjoyable way, where the teacher will only act as a facilitator and students will make an effort of learning and evaluating on their own. From the aforementioned data and interpretation that was presented, the researcher found that there were definite shifts in the post test score of the experimental group of grade 7^{th} std . A process of qualitative questions put across after the presentation has clearly depicted the interest and future action for the Experimental group

CHAPTER 5

INFERENTIAL ANALYSIS

CHAPTER 5

INFERENTIAL ANALYSIS

5.1 Need for Inferential Analysis

Quantitative research aims to test theories about the nature of the world in general based on samples of "subjects" taken from the world. When we perform research on the effect of TV violence on children's aggression, our intent is to create theories that apply to all children who watch TV, or perhaps to all children in cultures similar to our own who watch TV. We of course cannot study all children, but we can perform research on samples of children that, hopefully, will generalize back to the populations from which the samples were taken. Inferential statistics is the mathematics and logic of how this generalization from sample to population can be made. The fundamental question is: can we infer the population's characteristics from the sample's characteristics? Descriptive statistics remains local to the sample, describing its central tendency and variability, while inferential statistics focuses on making statements about the population.

The methods of inferential statistics centre on the process of examining a sample of data about some set of entities of interest and through use of the evidence available in the sample, making an inference about some characteristic of the population. The goals are to make correct inferences, to avoid incorrect inferences, and to have a clear idea of just how likely it is that a particular inference is correct. The usual path to this goal is to make explicit a statement, called a "statistical hypothesis," concerning the population characteristic and then to apply a statistical technique to the evidence in the sample in order to reach a decision either to accept or reject the hypothesis.

A particular virtue of inferential statistics is that it calls attention to the fact that many phenomena are by nature variable, and that observed differences may often be due to nothing more than chance. Thus, inferential statistics furnishes tools by which to decide whether an observed difference is "significant," in a strict technical sense, i.e. that the difference is very unlikely to be due to chance.

5.2 Hypothesis Testing

A hypothesis is a tentative conjecture explaining an observation, phenomenon or scientific problem that can be tested by further observation, investigation and experimentation. It is an assumption taken to be true for the purpose of argument or investigation. According to Best and Kahn, “The research hypothesis is a formal affirmative statement predicting a single research outcome, a tentative explanation of the relationship between two or more variables.”

A hypothesis is tested with tests of significance, which involves the assessment of the probability of specific sampling results under assumed population conditions. Assumptions about the population parameters are made in advance and the sample then provides the testing ground of these assumptions. An inference is also drawn about the relationships among variables.

Inferential analysis involves an estimate of the accuracy of the inference, which is expressed in terms of probability determined from the relevant statistical distribution, i.e. confidence levels.

The parametric statistical analysis technique which has been used in the present study is the “*t” test.*

Testing of Hypothesis H_o1

Study Objectives

1. To compare the post-test science achievement scores of experimental and control group
2. To evaluate the effectiveness of peer learning scenarios as perceived by peers

Hypothesis

In pursuit of the objective, the following hypothesis was formulated:

H_O1: There is no significant difference in the post-test science achievement scores of experimental and control group of grade 7th std

Group	Sample	Mean	SD	$S.E_M$	Df	Calculated t value	Table value 0.05	Table Value 0.01	Los 0.05	Los 0.01
Experimental group	28	30	8.33	1.57	47	2.16	2.01	2.68	S	NS
Control group	28	24	12.42	2.34						

* Los: Levels of significance

* S: Significant

*NS: Not significant

Interpretation

From the table, it can be seen that the obtained value of "t" is 2.16 which is more than the table value at 0.05 level. Hence, the null hypothesis is rejected at 0.05 level of significance. However, the calculated value of "t", which is 2.16, is less than the table value at 0.01, which is 2.68. Hence, the null hypothesis is not rejected at 0.01 level of significance.

Conclusion

There is significant difference between the post-test science scores of experimental and control group at grade 7 at 0.05 level.

Discussion

The initial conceptualizations of the students regarding peer learning and teaching were very limited. Students' learning involves only passive listening by the teachers and straight away putting the same into examination. Process of exploration and construction were never part of studies.

There was not much thought given to the complexities of students' learning, nobody thought the purpose of education must be to prepare all citizens for a meaningful and productive life, so that they will build up to have a more constructive and reasonable knowledge at place.

The various sessions that the researcher undertook scaffolded the understanding of these complex issues in an interesting way while also promoting argumentation, promoting connection to everyday Learning and teaching and evaluating each other knowingly or unknowingly and got the essence of collaborative learning. Various perspectives of students were discussed and debated in a supportive and non-judgemental environment.

Therefore, there was a definite shift in the post test achievement scores because the students learning had been challenged and now they are much confident and ready to have such challenge which will only make them grow and have a deeper understanding of concept they are collaborate learning in the class

5.3 Research Questions

Answers to the research questions were gleaned not only from the quantitative data but also from the **videos of classroom Presentation transcribed by the researcher, qualitative interview that the researcher maintained and reflections and feedbacks evaluated by peers in the process**Following is the discussion of the research questions addressed in this study.

5.3.1 Research Question 1

1. How do peers perceive peer learning scenarios?

Findings:

Researcher had conducted open ended interviews both before the presentation and after the presentation taken place. Students had magnitude of reactions when they were asked to present the science topic in the class. Somewhere Apprehensive on what is going to be the situation? who will be the group members? how the teacher is going to divide the group? and what sub topics will be allocated to them? group 1 has expressed, “will I be having good intelligent students in my group so that my group will win.”

Some group members were nervous while others were surprised as the situation is for the first time in front of them, while group 6 and group 8 were confident in knowing that they are going for the presentation of the said topic of science. Group 7 member had clearly expressed, “ we all have only one goal to be confident and perform good in the class.”

After the presentation taken place students seem to be much more confident and Prepared. Experimental Groups had expressed that they learnt many do’s and don’ts, group 6 members said,” students were not nervous they have made there ppt slides also attractive and simple to explain. We must learn from them.”

Group 2 members said, : I saw a great bonding developed into the groups there were good coordination. Topic allocation was also done nicely “. Students also expressed they no longer need teachers explanation as they can approach any of their peer who are through the topic and can get more deeper understanding of the topic .

Discussions :

From the aforementioned data and interpretation that was presented, the researcher found that there were definite shifts in the post test score of the experimental group of grade 7^{th} std . A process of qualitative open ended questions put across after the presentation has clearly depicted the interest and future action for the Experimental group. They seem to be more confident and ready for future per learning scenarios

2.What are the specific challenges of peer learning scenarios?

Findings:

Since for the students it was the first time they had presented in the class, there are quite agood amount of challenges students faced during the process of peer learning scenarios .

Group members expressed that they have taken it towards the lighter side.

Group 7 mention," we were not confident enough, we all were nervous to present in front of the class."

Group 6 mentioned, "we think we would have explained more deeply and better, we were more like reading the slides."

Challenges students faced were lack of time, only 5 days' time were given to the students to prepare the topic. Choice of topic was an issue where everyone wants to go for easier topics. Another challenge was when asked question by the different group members, some of students from the performing group were unable to explain

Overall group members felt they could do much better. And hence they will try to make it possible to do better in the future presentation

Discussions:

From the aforementioned data and interpretation that was presented, the researcher found that since it was for the first-time student presented in front of the class. There were many challenges students faced. But with lots of learning taken with the first presentation. Another peer learning scenarios will be more positively handled and can be taken more seriously

3. What kind of impact is created by peer learning scenarios?

Findings:

Students have taken this learning scenarios very positively. they understood that peer learning has lot of benefits individually there were lot of learning in the process of peer learning and preparing for the presentation,

Students have expressed various impactful learning they had, some expressed, they made new friends, some said we got acquainted with new technological tools, some expressed building up the confidence while some said they found leaders in themselves Group 6 expressed, " Learning was – how to make PPT, we found a leader in ourselves, and we were happy with the right instructions of the leaders, there was teamwork.", Group 4 members said we created good bonding , " we went to each other's home, did teamwork , made ppt and had fun."

Discussions:

From the aforementioned data and interpretation that was presented, the researcher found that there was a good impact being created in just one presentation, students learnt from other group members .They learnt how to use technology for there betterment. Deep researches were taken place to have a thorough underrating of the topic and most important impact all peer had had is they collaborated with each other and created good bonding amongst the peers.

Researcher also tried to understand whether in future also they would like to have such peer learning session, every member of experimental group expressed, they will be all ready and happy to have such sessions again. And they will also make sure what do's and don'ts need to be followed.

CHAPTER 6

SUMMARY AND CONCLUSION

CHAPTER 6

SUMMARY AND CONCLUSION

6.1 A Paradigm Shift

There is a paradigm shift from traditional teachers teaching to student centered learning and teaching. One of the long historical method of teaching in educational systems has always being lecture. Teachers presented the principles, concepts and facts through instructor. Verbal learning, listening and take notes from comprehensive are the fundamentals of this method, explaining and describing the phenomena by the teacher has a major role. It has always been a monologue class where students act as a passive member of the community only to have great listening skill and note taking strength.

These days teachers encourage student-centered learning by allowing students to share in decisions, believing in their capacity to lead, and remembering how it feels to learn.

The teacher is still the classroom authority figure but functions as more of a coach or facilitator as students embrace a more active and collaborative role in their own learning.

What is needed, therefore, is that learning involves a process of exploration and construction, and that knowledge is ‘the outcome of the child's own activity’ – ‘neither the textbook nor the teacher is an authority’. And the purpose of education must be to prepare all citizens for a meaningful and productive life, so that they will build up to have a more constructive and reasonable knowledge at place.

NEP 2020 has been articulated keeping in view the interests of students. National Education Policy is student-centric, the policy has understood the fact that in this new paradigm, a student is at the centre stage. Today's student is mature and informed, learns differently, learns while working, learns throughout life, and expects flexibility. Also, as industries recalibrate and adapt to digital, socioeconomic, ecological, and demographic drivers of change, most occupations and job roles are undergoing a fundamental transformation. In this backdrop, the National Education Policy (NEP 2020) unveiled by MHRD, now the Ministry of Education, is a pertinent move to prepare the country's workforce for the future needs of a knowledge economy.

Active learning methods ask students to engage in their learning by thinking, discussing, investigating, and creating. In class, students practice skills, solve problems, struggle with complex questions, make decisions, propose solutions, and explain ideas in their own words through writing and discussion. Active learning shifts the focus of learning – from passively (and possibly unquestioningly) digesting information to being accountable for actively engaging with sources and perspectives. Active learning pulls students out of their comfort zone by creating an environment where risk taking is encouraged. As they get more comfortable sharing their thoughts, defending their conclusions and building on each other's ideas, they'll gain confidence and self-possession

Peer learning method is a continuous part of human learning and is a teaching strategy in which non-professional teachers with different ages and same learning levels, help each other to learn from each other. Peer learning encompasses a broad sweep of activities. These ranged from the traditional model, in which senior students tutor junior students, to the more innovative learning cells, in which students in the same year form partnerships to assist each other with both course content and personal concerns. Other models involved discussion seminars, private study groups, a buddy system or counseling, peer assessment schemes, collaborative project or laboratory work, projects in different sized groups, workplace mentoring and community activities. Students learn a great deal by explaining their ideas to others and by participating in activities from which they can learn from their peers. They develop skills in organizing and planning learning activities, working collaboratively with others, giving and receiving feedback and evaluating their own learning.

Peer learning can prompt a sense of responsibility for one's own and others' learning and development of increased confidence and self-esteem through engaging. Working with others peer learning can provide opportunities for deep engagement in the learning process, as students are learning through their

relationships with peers. Students are often better able to reflect on and explore ideas when the presence and authority of a staff member do not influence them. In peer learning contexts students generally, communicate more about the subject area than they do when staff are present.

Peer learning settings provide opportunities for additional self and peer assessment of a formative kind. It provides opportunities for giving and receiving feedback on one's work and a context for comparing oneself to others. This mirrors the kinds of informal assessment activities which take place daily in the world of work: self-assessment and peer judgements are more common and can often have a more powerful influence in professional work than formal appraisals. Practice in identifying criteria to assess one's own learning and applying this in a variety of circumstances is a key element of sustainable assessment needed for lifelong learning

Vygotsky (1978) suggested that in order for learning to take place, people should talk and interact with each other. People naturally learn from each other and work cooperatively in their everyday lives. Vygotsky viewed cooperative learning approach as important part of a process which leads to the social construction of knowledge.

Christison (1990) considered cooperative learning as a good strategy to increase the attention and motivation of the student.

Oslen and Kagan (1992) reported cooperative learning as an activity which depends on the social interaction and exchange of information between students working in groups and each student is accountable for his own learning.

6.2 Significance and need of the study

Rationale of the study :

School environment has a strict code of conduct, they believe that students learn better when they are seated in quiet rows, receiving teacher-directed instruction, rather than working with one another. Students

can share their ideas with the class as a whole; however, sharing and learning with partners are comparatively very less encouraged in schools.

Schools today need to reposition the education system in a way that can develop rationally literate future citizens who uses critical thinking in their learning and understanding

The Researcher has understood that there was a crucial need to understand and provide multiple ways of Learning and teaching so the future students may have success and achieve great results in their academics.

Teachers can act as a facilitator and encourage the class to develop higher order thinking skills and increases their understanding of the concept more deeply

Peer learning showcases students' ability to apply valuable organizational skills. These include researching, planning, and making decisions.

Peer learning can prompt a sense of responsibility for one's own and others' learning and development of increased confidence and self-esteem through engaging.

Therefore, the things students learn about that topic stay in their memory longer as well. Peer learning encourages students to direct their own learning (with guidance). Students develop perseverance through hard work and in-depth research. They also learn to manage setbacks and obstacles.

The teachers mostly used traditional approaches such as lecture, narrative, and discussion. In light of these considerations, it was determined that a new approach to the teaching of the science subject is required.

The researcher believed that using Peer learning scenarios may be used more successfully to engage all students and improve assimilation of the subject by all students in the class, as well as to generate a sense of achievement and engagement among the students.

With all of the research supporting Peer learning, the researcher planned to shift the teaching focus to student-directed lessons with hopes of building student success in learning and increasing motivation in overall academics. Mrs Pooja Birwatkar, coordinator of MEd, has supported the researcher to full extent to conduct this study and enable each aspiring teacher to adopt this method of peer learning and peer evaluation for overall achievement in lifelong learning.

For the students:

Research on using Peer Learning and evaluation scenarios has shown that it increases student interest and motivation, improves the development of their higher order thinking skills and increases their understanding of the concept more deeply. It requires students to use higher order thinking (Bloom, 1980, and Krathwohl and Anderson, 2001) to evaluate, analyze and synthesize information to address the issue under discussion, rather than a focus on recall of definitions or rote memorization of the concepts. Employers are looking for people with skills such as decision making, negotiating, oral and written communication, self-awareness, and teamwork, which are cultivated as students work through Learning and involving themselves with their peers. Students are exposed to multiple perspectives and are able to develop their own position which prepares them to tackle the issues that they will face in the world outside of the formal school environment (Sadler and Zeidler, 2004).

For the Teachers:

There is a paradigm shift from traditional teachers teaching to student centered learning and teaching. These days teachers encourage student-centered learning by allowing students to share in decisions, believing in their capacity to lead, and remembering how it feels to learn.The teacher is still the classroom authority figure but functions as more of a coach or facilitator as students embrace a more active and collaborative role in their own learning

Since Peer learning and evaluation demands open-ended and student-directed inquiry, the teacher must take on the role of a facilitator. As teachers become more informed in their pedagogical practices, they are more likely to incorporate students centred learning into their teachings, and provide innovative learning opportunities for their students.

For the School Authority

Schools today need to reposition education system in a way that can develop rationally literate future citizens who uses critical thinking in their learning and understanding. Students must be encouraged in their learning by thinking, discussing, investigating, and creating. In class, students practice skills, solve problems, struggle with complex questions, make decisions, propose solutions, and explain ideas in their own words through writing and discussion. Peer learning can prompt a sense of responsibility for one's own and others' learning and development of increased confidence and self-esteem through engaging. Working with others peer learning can provide opportunities for deep engagement in the learning process, A pertinent move to prepare the country's workforce for the future needs of a knowledge economy.

For the Curriculum Developer:

Teachers are co-developers of curriculum today and the inclusion of child centeredlearning into the curriculum can engage students to be a citizens for a meaningful and productive life, so that they will build up to have a more constructive and reasonable knowledge at place.

6.3 Statement of the Problem

The title of the study is as follows:

"A Study of the Impact of Peer Learning Scenario from the perspective of Student Achievement and Peer Evaluation".

6.4 Aims and Objectives of the Study

6.4.1 Aim of the Study

1. To evaluate peer learning scenarios in terms of their impact onstudent's subject achievement

2. To understand how peers evaluate Peer Learning Scenarios

3. To overall evaluate the effectiveness of peer learning scenarios

6.4.2. Objectives of the Study

4. To compare the post-test scienceachievement scores of experimental and control group
5. To evaluate the effectiveness of peer learning scenarios as perceived by peers
6. To understand the effectiveness of peer learning scenarios

6.5 Hypothesis and Research Questions

In pursuit of the objective, the following hypothesis was formulated:

H_O1: There is no significant difference in the post-test science achievement scores of experimental and control groups

6.5.1 Research Questions

1. How do peers perceive peer learning scenarios?

2. What are the specific challenges of peer learning scenarios?

3. What kind of impact is created by peer learning scenarios?

4. How effective is peer learning scenarios?

6.6 Variables of the Research

The title of the research problem, the objectives of the study, the investigative questions and the hypothesis consist of concepts known as variables. These variables should be precisely defined. This is an important step in the formulation of the research problem. It is the definition of the variables that determines the information needs of the study. Therefore precise definition of variables is essential for planning the subsequent steps in the research process.

- **Independent Variable**: Peer Learning Scenarios
- **Dependent Variable:** Student Achievement

6.7 Definition of Key Terms

6.7.1 Conceptual Definition of Key Terms

The conceptual definition is considered to be the scientific text book definition of a variable. It is used to describe the theoretical ideas and research findings to others in the field.

- **Peer learning Scenarios:** Students learning from and with each other in both formal and informal ways'
- **Peer Evaluation:**Refers to the many ways in which students can share their creative work with peers for constructive feedback, and then use this feedback to revise and improve their work.
- **Achievement:** It refers to a thing done successfully with effort, skill, or courageAlso, the process or fact of achieving something.

6.7.2 Operational Definition of Key Terms

The operational definition is a quantification of a nominal definition, i.e. it is a definition in terms of specific measuring or testing criteria or operations. This definition specifies the operations which observe, measure and record the phenomenon symbolized by the concept. Operational definitions concretize the intended meaning of a concept in relation to a specific study and provide some criteria for empirical existence of that concept (Frankfurt-Nachmias and Nachmias, 1996).

- **Peer learning Scenarios-** in this research peer learning scenarios are those which comprise of peer presentations and peer teaching
- **Peer Evaluation -** in this research peer evaluation will be done by taking interviews of the peers regarding their perception about their peer presentations and also regarding the specific challenges encountered by them while planning and executing peer teachin**g.**
- **Achievement-** in this research achievement is evaluated in terms of an achievement test created by the researcher in some selected topics of science which were taken for peer presentations.

6.8 Scope and Delimitations of the Study

6.8.1 Scope of the Research

- **Policy Makers:** This research will help the policy makers in inculcating peer learning ideas in teacher education, also encompassing various student centric teaching and learning in school and state level
- **Curriculum Developers :**This research will help the Developers to include various self learning concepts and group activities in their books so published
- **Teachers:** This research will help the teacher to act as a facilitator or a partner in the learning process of the children
- **Students:** This research will help the students to be independent learners, can choice their pattern of learning and understanding. And explore ways to discover the inner strength

6.8.2 Delimitations of the Research

The study is delimited in terms of

- **Geographical Delimitation:** The present study is limited to only one SSC board school of Mumbai district
- **Sample Delimitation**: The study is delimited in terms of considering only secondary students preferably grade 7
- **Tool Delimitation:** Tools of research will be in English and will be made by the researcher only

The study is delimited in terms of considering only few selected topics in science subject

6.9 Research Design

Research Design- Mixed method Design

Quant- Qual ⟹ data interpretation

Quantitative - Quasi Experimental Study -- 2 groups non-randomized subjects post-test design only

E X _____ O2

C — _____ O2

2 groups - experimental and control will be selected. Post-test will be taken

Qualitative -- The qualitative data will be collected in terms of interviews of different groups regarding their peer presentation experience both in terms of learners and as presenters.

6.9.1 Data collection Procedure:

Population and Sample of the Study

Population will comprise of all the secondary school students from SSC board different

Sample of the Study

Purposive (convenience) sampling, also known as availability sampling, was used in this study. The purposive sampling is a specific type of non-probability sampling method that relies on data collection from population members who are conveniently available to participate in a study.

The sample of the study willconsist of the students of two Division of SSC Board studying in Class VII in Mumbai. The sample will be selected with the help of **Purposive sampling technique**.

Two groups will be selected from grade 7th Std. Total of 80 students are going to be studied as a total sample size. 80 students will be divided into two groups consisting of 40 each. One will be an experimental group, the other will be a control group. 7th STD Div A consisting of 40 students will be considered as an experimental group. Experimental group will be further divided into 8 small groups on a convenience basis and will be asked to make PPT presentations and do peer teaching in the class. Participants reported that they never used a Peer teaching model for instruction before the experiment

Control group on the other hand will be Div B of Class 7th std, consisting of 40 students each. They will be getting the learning with teacher instructed method or traditional method of teaching

6.9.2 Tools:

Tool 1: Achievement test: Researcher will prepare only 1 post-test (achievementtest) on two topics from science subject . The test will comprise of both Objective as well as subjective questions consisting of subject knowledge understanding and application. This achievement tool will be prepared by the researcher. Face validity and content validity of the tool will be established with the help of experts. Test - Retest Reliability will be done.

Tool 2: Interview: The Interview Schedule will be prepared by the Researcher. The interview will be in a Semi structured format which comprises 15 questions in the following areas

- The perception about the students presenting and doing peer teaching
- Challenges faced by the students during the experiment
- Initial reactions of the students when topic was allocated
- Division of the topic among the group members
- Learning in the process
- Group formation procedure, about the leadership process
- Medium of presenting in the class etc

Tool 3: Observation tool: The researcher had used various open ended questions before the peer learning process takes place and noted important points related to the attitude and feeling of the presenter. The

researcher had observed the feelings and gestures when the students were given topics and asked to present in the class on behalf of the respective class teachers

6.9.3 Data Collection Procedure:

- The Researcher will then be obtaining permission from the Principal of School for conducting the lessons and the research module
- Out of the two Division Of 7th standard of SSC Board School that will be used for the study, one will be assigned to the experimental group while the other will be assigned to the control group.
- For both the groups, the researcher will be selecting two topics of approximately equal difficulty level in the Science subject of Class VII and prepare the Peer teaching presentation for the same.
- Around 7 to 8 groups will be made to give the presentation on the allocated topics
- Duration will be around 30-35 minutes for each
- Later the Post test will be taken on the topics being presented
- Control group on the other hand will be Div B of Class 7th std, consisting of 40 students each. They will be getting the learning with teacher instructed method or traditional method of teaching. Control group will also be giving the post test after the teachers' teachings get done.

6.9.4 Data Analysis:

The data of the present study will be analyzed quantitatively as well as qualitatively. The Researcher will use the following descriptive and inferential statistical techniques for data analysis and draw the conclusion.

a) <u>Quantitative Analysis of the study</u>:

i) <u>Descriptive Analysis</u> - In the present study, the following descriptive analysis will be used.

•**Measures of Central Tendency** - The measures of central tendency computed for the present study will be Mean, Median and Mode.

•**Measures of Variability** - Variability is described as the dispersion or spread of separate scores around the central tendency. The measure of variability used in the present study will be Standard Deviation.

•**Measures of Divergence from the Normality** - Measures of Divergence used in the present study will be Kurtosis and Skewness.

•**Graphical Analysis** - Frequency Polygon and Pie Diagram will be used.

•**t-test**: An independent t-test will be used to determine whether there is a significant difference in the Post-test Achievement scores in science among the Upper Primary students.

b) <u>Qualitative Analysis of the study</u>:

The data will be collected through Semi-structured Interview Questionnaires prepared by the researcher and will be analyzed

- By coding the data
- Rating appropriate categorization from the team.

This will assist the analysis of the data and help in conceptualization of the findings.

6.11.3 Recommendations for Further Research

Given the significance of Peer learning scenarios in education, it is surprising to note that there are hardly any studies in this area in India. While the present study focused on the peer learning and their evaluation for better achievement scores in the institution, further research is required in other states to ascertain the generalisability of results.

The following represent some of the avenues for future research in this area:

- A survey of students perspectives in involving peer learning and teaching in Indian classrooms
- A study of the role of school leadership in the context of Peer learning and assessing
- A study on transitioning from a conventional classroom to new classroom based on collaborative learning: A case study

- Implementation of a Peer learning in primary school classroom: A Students perspective

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APPENDIX

Appendix I: List of Experts

Name	Designation	Institution
Ms. NaziyaShaikh	School Coordinator	Madhusudan Global School , Mira road
Ms. Rupali Jhadav	School Secondary Coordinator	Madhusudan Global School , Mira road
Ms. Nisha Punia	Science teacher	Madhusudan Global School , Mira road
Ms. Jaspreet Nanda	Science teacher	Madhusudan Global School , Mira road

Appendix II: Pretest presentation feedback

1. What do you prefer Presentation or teachers Teaching?

2. What was your initial reaction when you got to know about group presentation?

3. Where you all excited or scared?

4. How did you all divide the work?

5. Is all group member adjusted?

6. What do you think should we involve teachers in the presentation or will be managed easily by you all?

7. What do you think about the size of the group?

8. What do you feel about learning in the process?

Appendix III: Post-test presentation feedback

1. How was the experience of the entire peer teaching presentation?

2. Are you satisfied with your presentation?

3. Do you think next time also we must do the presentation method for teaching and learning?

4. Will you be much better next time?

5. Now do you still require teacher's explanation or you all have understood from your peers?

6. What do you think others have learnt from you?

7. What is your experience from others group?

8. What d you think went wrong during this presentation?

9. If given a test, will you all be ready for the same?

Appendix IV: Students Achievement Test [40M]

Achievement Test [40M] :

Q.1] Fill in the blanks: [5M]

1. Due to _____, the total water of the world remains constant.

2. Seawater is _____ in taste.

3. The groundwater present between the layers of hard rocks below the water table is called _____.

4. _____ slows down the flow of rainwater on land and increases the absorption of water by soil.

5. The percentage of water present in human body is _____.

Q.2] Choose the correct answer for each of the following: [5M]

1) Thunderstorms develop in

a) Hot, humid and tropical areas. b) Hot and dry areas.

c) Cold and dry areas. d) Hot and dry temperate areas.

2) Thunderstorms are accompanied by

a) High speed winds. b) Heavy rainfall c) lightning d) all of them

3) Tornadoes are also called

a) Hurricanes b) twisters c) thunderstorms d) typhoons

4) The cyclones developing in Bay of Bengal and Indian Ocean are called

a) Hurricanes b) typhoons c) twisters d) cyclones

5) The cyclone prone areas in India are

a) The northern parts b) central parts

c) Along the coastline d) away from the coastline

Q.3] Match the two columns: [5M]

Column A Column B

1. Infiltrationi) Upper level of groundwater

2. Water table ii) Scarcity of water

3. Purest form of water iii) Seepage of water

4. Increasing population iv) Saline water

5. Ocean water v) Rainwater

Q.4] State whether the following statements are True or False [5M]

1) An increase in pressure indicated the possibility of a storm.

2) Cyclones in western Atlantic and eastern pacific regions are called typhoons.

3) Scientists who study weather are called meteorologists.

4) The instrument used to measure the speed of air is called barometer.

5) Wind blows from land to ocean in winter.

Q.5] Answer the following questions:

1) Nearly three – fourths of the earth is covered with water, yet there is an acute scarcity of

water in many parts of the world. Give reasons [2M]

2) Agricultural activities lead to depletion of water table. Explain [2M]

3) Discuss the importance of water for plants. [2M]

4) In what condition does a cyclone develop? What is its impact on human lives? [2M]

5) Describe a few safety measures which people in cyclone prone areas should take.

[2M]

6) What is the difference between a thunderstorm and a tornado? Which is more

devastating and why [3M]

7) With the help of your own experience, explain that air exerts pressure. [3M] 4) Describe Water cycle with the help of diagram [4M]