Scientific Approaches Used by Science Teachers at the Elementary Level

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Abstract

This study was designed to stipulate an image of occurring science practices in elementary schools. The main objective of this study is to investigate the types of science teaching practices that have been preferred to use by science teachers to teach science subjects. All elementary science school students in Lahore City are the population of this study, 300 science students were randomly selected as a sample of this study. The sample represents the population of the study which indicates its generalizability and through this sample researcher trying to find teaching practice in reality that increases its validity. The purpose of the sample from the public (male and female) and private schools (male and female) is to investigate the clear picture of elementary school practices, that increase the generalizability. The study employed a newly developed 40-item questionnaire on a points Likert scale [always=5, often=4, sometimes=3, rarely=2, never=1] which was pilot-tested before the study on 10% of the total parent sample study adopted a survey research design and data was collected through a newly developed reliable questionnaire with Cronbach alpha = 0.95. The data was entered and analyzed by using SPSS. The study result reveals that elementary school science teachers prefer lecture and discussion methods for science teaching. Science teachers should adopt recommended teaching methods to develop a better understanding of science among students.

Key Words: *Science Teaching Practices, Elementary Schools, Science Teachers, Science Students, Teaching Methods.*

1. Introduction

Many different ways of teaching are used in science classes. Miles asserts that teachers should use different strategies to help all of their science students do well in the classroom.[1] For a plan to work well in the modern world, it must give people as many chances as possible to work together. Both students and teachers gain a lot from social interactions.[2] These authors also talked about how important it is to give students a safe, friendly, and interesting place to learn that encourages them to ask questions and share their thoughts. The two most important parts of scientific education pedagogy are the lecture and the lab practice. We will talk briefly about these methods.

The teaching method is often used to teach a lot of information to a group of students in a short amount of time. Gehlen-Bauum and Weinberger provides that the point of a talk is to tell a large group of students something new.[3] This method has helped teachers handle large classes in the past. It could also be a school for a small group of people. Researches show that this method is used by the great majority of universities and colleges today.[4]

The teacher is a very important part of any school system. A person who teaches is usually called a teacher. The part of the teacher is very important to the success of science programs in high school. Orlando says that a great teacher is also a good boss. In intermediate schools, science education depends a lot on the work of teachers, in his opinion, "a great teacher creates a sense of community and belonging in the classroom and makes it a supportive, collaborative place to

[1] Miles, "Teaching Methodology and Its Effects on Quality Learning," Journal of Education and Practice 6 (2015).
[2] Xornam S. Apedoe, Sally E. Walker, and Thomas C. Reeves, "Integrating Inquiry-Based Learning into Undergraduate Geology," Journal of Geoscience Education 54, no. 3 (2006): 414–21, doi:10.5408/1089-9995-54.3.414.
[3] Vera Gehlen-Baum and Armin Weinberger, "Teaching, Learning and Media Use in Today's Lectures," Computers in Human Behavior 37 (2014): 171–82, doi:10.1016/j.chb.2014.04.049.
[4] Louis Deslauriers, Ellen Schelew, and Carl Wieman, "Improved Learning in a Large-Enrollment Physics Class," Science 332, no. 6031 (2011): 862–64, doi:10.1126/science.1201783.

learn."[5] Science is about studying the world in an orderly way. They said that science rules the world, protects humanity, and is the key to our survival.[6] As you can see, a Science teacher needs to know not only a lot about the subject to be taught, but also how that material is put together. A great teacher should also always be on the lookout for ways to be more productive and keep their students interested. So, the way the teacher deals with Science will depend on what he or she thinks Science is. Natural science education is important because it gives kids the critical thinking skills they need to be a part of today's high-tech culture. Science education gives students the tools they need to find a lot of information that can help them learn more about the world and how and why it works the way it does. Composite systems are important to everyday life, from the human body to current transportation technologies. Teachers teach students how to explain how and why these systems work. Children and students can use this knowledge to learn new things, make good decisions, and find out more about things they are interested in. Teaching science also gives children real-world proof of many things they read about or see on TV. This helps them think critically and remember what they have learned. It takes more than being able to make eye-catching pictures and use complicated classroom technology to be a good teacher.[7] To be a good Science teacher, you need to know a lot about human nature, behavior, how groups work, and how people learn. There are many ways for science teachers to get involved outside of their professional groups. Science Teachers to stay up-to-date in their areas so that students don't just listen and repeat what they hear[8]. Science teachers should also use texts that help students learn about science

[5] Derek Curtis Bok, Our Underachieving Colleges: A Candid Look at How Much Students Learn and Why They Should Be Learning More ... (Princeton (N.J.): Princeton University Press, 2008).
[6] Amy F Brandon and C All Anita, "Constructivism Theory Analysis and Application to Curricula," Nurs Educ Perspect 31, no. 2 (2010): 89–92.
[7] O. M. Okoro, Principles and Methods in Vocational and Technical Education. (Nsukka: University Trust Publishers., 2006).
[8] Catherine Crouch et al., "Peer Instruction: Engaging Students One-on-One, All at Once," essay, in Research-Based Reform of University Physics, ed. Edward F. Redish and Patrick Cooney (College Park: American Association of Physics Teachers, 2007), 1–55.

by having them do things like classify, count, measure, and interact with scientific items and events. You can learn manual dexterity by handling and using tools, and you can learn scientific thinking by doing experiments and explaining the results. In middle school, a science teacher has a wider range of tasks because the subject is taught as a whole. In high school, on the other hand, science is broken down into its parts, such as biology, physics, math, and chemistry. Science teachers need to know a lot about their subject area in order to make good lessons and choose fun activities for their students. Competencies for educators are the things that make a good teacher. One sign of a good Science teacher is how much they help their students grow as people, academically, socially, and physically.

A teacher's competency in the classroom can be measured by things like self-confidence, neatness, commitment to the job, excitement about teaching, and care for his or her students.[9] Other important things for a teacher to have are the ability to get and keep students' attention, the ability to use teaching aids or make up their own when necessary, the ability to plan and prepare lessons well, and the right qualifications and knowledge of the subject. said that how teachers connect with their students is "possibly the most important thing they do." When students are working on a project, piece of work, or self-study, the teacher acts as a coach. As Sue (2013) put it, "the teacher is a walking resource center ready to help if needed." Bringing the teaching to the learner's intellectual range (level) and helping the learner understand is hard, but the inquiry process of learning gives the students the joy, excitement, and enjoyment they need to keep working toward

[9] D.O. Arubayi, "Teaching of Clothing and Textiles in Tertiary Institutions: An Appraisal of Course Objectives and Contents," Studies on Home and Community Science 4, no. 1 (2010): 51–55, doi:10.1080/09737189.2010.11885299.

the goal.[10] A good science teacher should also be democratic, patient, kind, considerate, and interested in both the topic and the development of the students.

2.1.Significance of the study

The main goal of the study was to shed light on how the evolution of scientific methods has changed elementary school science education and to show, through the lens of specific units, how this standard might be useful by helping teachers learn to apply the scientific method to real-world problems through hands-on experience.

2.2.Objectives of the Study:

The following were the objectives of the study:

1. To explore what the curriculum describes about science for example the teaching methods stated.
2. To find out what kind of teaching methods used by teachers.
3. To find out what kind of teaching to the students to teach them science at the school.
4. To investigate how student teachers experience the teaching methods they receive from science teachers.
5. To explore how relevant and useful are the teaching methods and the whole preparation students receive from the school to provide them to teach science

2.3.Research Questions

Research questions of this study are in following:

1. Which methods are confirmed in the curriculum that teachers use to teach student teachers courses within science?

[10] Derald Wing Sue, "Race Talk: The Psychology of Racial Dialogues.," American Psychologist 68, no. 8 (2013): 663–72, doi:10.1037/a0033681.

2. Are there any practical methods used to prepare student teachers to teach at school level?
4. How do teachers vary their teaching to meet the needs of all student teachers?
5. How do the student teachers feel prepared to teach the subject science at the school?

3. Review of Literature

Science education is an essential unit because it gives students the analytical skills, they need to make a difference in a world that is becoming more and more scientific. Science education is important because it gives students access to a lot of knowledge and information. This helps them understand the world and their place in it. The goal of education is to make people who can explain how complicated systems work, from the human body to the transportation technologies of the future. Students and kids can use this knowledge to understand new ideas, make good decisions, and get benefits they didn't know about before. Teaching science not only helps people think critically and remember things, but it also gives us proof that many things we read or see on TV or in books are true.[11]

Science gives many students ideas and drive to do their best. It gives them a chance to think about what they already know and what they want to learn in the future. This helps them understand scientific events and the scientific world better. Students who do well in science classes tend to get better at thinking critically as time goes on. Teachers guide and support learning by using cutting-edge science teaching methods that help students develop their reasoning and decision-making skills and then test them. They plan and run classrooms that are best for inquiry-based science education for kids. In any plan for education, the teacher is at the heart and plays a very

[11] James R. Anderson, "To See Ourselves as Others See Us: A Response to Mitchell," New Ideas in Psychology 11, no. 3 (1993): 339–46, doi:10.1016/0732-118x(93)90005-x.

important part. Science has become more important as a core subject for many reasons.[12] You can't say enough about how important it is for a science teacher to get students interested in and appreciative of the scientific process for life. Even if a science teacher has a state-of-the-art lab, state-of-the-art tools and equipment, the perfect lesson plan, and enough time to teach, he won't be successful unless he loves his job, knows the subject, and knows how to teach science.[13]

4. Theoretical Model

The students are the focal point of the constructivist learning circle, which places them at the forefront of the educational experience. Open-ended questions that force students to think and prompt them to ask each other questions are one strategy advocated by Brooks and Brooks for fostering critical thinking and inquiry in the classroom.[14]

What are the benefits of a robust discussion? Theory in education is crucial because it provides guidance for effective teaching practices. The theoretical underpinnings of this work are, thus, constructivism and the constructive debate theory. Learning is most effective when the instructor and student collaborate to create something new out of previously acquired information and skills.[15] The constructive theory paradigm is built on in-depth discussions with the end goal of generating fresh ideas for addressing issues.[16] Cooperation and rational debate are important skills that students should be taught. In this environment, students are more invested in finding solutions to issues, are able to think more critically, and retain more information. They create original and

[12] Scott V. Franklin, Eleanor C. Sayre, and Jessica W. Clark, "Traditionally Taught Students Learn; Actively Engaged Students Remember," American Journal of Physics 82, no. 8 (2014): 798–801, doi:10.1119/1.4890508.
[13] Vera Gehlen-Baum and Armin Weinberger, "Teaching, Learning and Media Use in Today's Lectures," Computers in Human Behavior 37 (2014): 171–82, doi:10.1016/j.chb.2014.04.049.
[14] Jacqueline Grennon Brooks and Martin G. Brooks, In Search of Understanding the Case for Constructivist Classrooms: With a New Introduction by the Authors (Upper Saddle River, NJ: Merrill/Prentice Hall, 2001).
[15] See supra note 3.
[16] David W. Johnson, Roger T Johnson, and Dean Tjosvold, "Constructive Controversy: The Value of Intellectual Opposition," essay, in The Handbook of Conflict Resolution: Theory and Practice, ed. M Deutsch, P. T. Coleman, and E. C. Marcus (Willey, 2006), 69–91.

practical solutions to problems.[17] Two or more people can have a constructive argument if they disagree on a course of action or an approach to an issue but are still interested in reaching a consensus. The key difference between a discussion and a constructive conflict is that the latter takes a collective rather than an individual stand on the contentious issue at hand. It's a strategy for instructing a group so that members with divergent viewpoints can come to a consensus using evidence and rational debate.[18]

The term "constructive controversy" based its definition on the premise that conflicts and conversations can serve as a springboard for learning more about challenging topics. Students will develop the ability to think constructively and creatively in order to address challenges.[19] It is difficult to reach a consensus when the two parties involved have divergent facts, ideas, conclusions, hypotheses, and/or perspectives.[20] The goal of the concept of constructive controversy is to achieve this very thing.

The two hypotheses were chosen over others because they were the most relevant to the discussion at hand. The strength of PI as a teaching method stems from the collaborative efforts of instructors and students. According to Rosenberg, Lorenzo, and Mazur, the ideal theoretical framework for PI is social constructivism since it emphasizes the importance of students' interactions with one another.[21] However, the fact that there is more than one correct solution in PI makes constructive controversy theory relevant. For a PI approach to learning to be successful, students must first learn to argue with one another in a way that makes sense. According to Mazur, many students

[17] Ibid
[18] Ibid
[19] Ibid
[20] Gary B. Smith et al., "The Ability of the National Early Warning Score (News) to Discriminate Patients at Risk of Early Cardiac Arrest, Unanticipated Intensive Care Unit Admission, and Death," Resuscitation 84, no. 4 (2013): 465–70, doi:10.1016/j.resuscitation.2012.12.016.
[21] J. L. Rosenberg, M. Lorenzo, and E. Mazur, "Peer Instruction: Making Science Engaging," essay, in Handbook of College Science Teaching, ed. Joel J. Mintzes and William H. Leonard (NSTA Publishers, n.d.), 77–85.

rely on memorization rather than experimentation when solving scientific problems.[22] It is common for kids to perform well on tests in scientific classes without truly understanding the material or making the necessary connections between the classroom and the real world.[23] The individual in question has never been exposed to authentic educational opportunities. It makes appropriate to assess PI because of the similarities between PI and actual learning. Genuine Education. Role-playing games, problem-based activities, case studies, and online engagement in communities of practice are common components of authentic learning environments.[24] When students are engaged in meaningful activities like working, discussing, and seeking knowledge, they develop a positive attitude toward school and their studies. Students are provided with 'real-world' experiences through authentic learning activities. Students are more likely to achieve their learning goals when they conduct investigations into real-world problems. Authentic learning allows students to learn independently in a safe setting where teachers may provide support and direction to struggling pupils. Learning that sticks comes from getting your hands dirty. Students are not passive participants in this type of learning. It's a form of inquiry-based education. According to research, students who engage in real learning are better able to think critically and master subject matter.[25]

A change in pedagogical paradigm is required to help students successfully apply classroom theory to real-world situations and raise their achievement levels in science classes. Changing to a more activity-based approach in the classroom is essential. Science educators, according to Miles,

[22] Eric Mazur, Peer Instruction a User's Manual (Upper Saddle River: Prentice Hall, 1997).
[23] See supra note 21
[24] M.M. Lombardi, "Authentic Learning for the 21st Century: An Overview," EDUCAUSE Learning Initiative 1 (2007): 1–12.
[25] See supra note 2.

should employ teaching strategies that call for more student participation.[26] Instruction should be based on academic research and promote as much student-to-student communication as possible.

5. Techniques for Developing Scientific Attitude

The responsibility for developing scientific attitude among the students lies on the teacher. The teacher presents himself to the students as sill example for his intellectual honesty, respect for other point of views, unbiased and impartial behavior in his dealings, open mindedness and the like. Students observe, the teacher having such qualities and it leaves a permanent impression on students to learn and adopt the same attitude. An enthusiastic teacher can help in development the scientific attitude through the curriculum. Teacher should give them projects through which provide opportunities in problem solving. Pupils who engage in wide reading in general science are believed to develop scientific attitude more than those who read only one textbook. Democratic atmosphere in the classroom allows students to undertake Cree discussions which will help them to remove difficulties and prejudices and there will be no wishful or biased thinking, on the part of students. This will develop in them open-mindedness and they will learn not to take things for granted unless they are proved by evidences. So, it has been observed that students imitates the teacher's qualities, it is therefore the prime duty of teachers to adopt scientific attitude in themselves and use scientific method their teaching.[27]

6. Methods of Teaching Science at Elementary level

In Latin, the word method means a way or a way of doing something. In education, it means the way that information is passed from the teacher to the student. Methods of teaching can be thought

[26] See supra note 1.
[27] Joshi, "Instructional Materials and Students' Academic Achievement in Physics: Some Policy Implications," European Journal of Humanities and Social Sciences 2, no. 1 (2005): 112–26.

of as the ways that teachers pass on information and skills and that students understand the knowledge and learn the skills as they learn.

A teacher can teach science in many different ways. But the best way to use depends on the goals of education and the circumstances in which learning will take place. However, the selection of a particular teaching method &pen& on various factors. The most important factors are:

1. Human factors
2. Objectives of teaching
3. Subject area
4. Time and material factors

Human Factors

The human factors that influence the selection of teaching methods are:

1. The teacher
2. The students
3. The environment from which they come

Subject Area

Because knowledge is connected to other kinds of information, you can't teach a single subject in isolation. Because of this, it is important for the means to use more than one strategy. So, it's up to the teacher to know when to use which techniques and how to use pedagogical tools in the most effective way to get the most out of them.

Time and Material Factors

The methods chosen should fit the specific needs of the subject, and practical things like the amount of rooms, audio-visual equipment, lab equipment, and location of the school should be taken into account.

Sixth, to make sure that the kids understand what is being taught. He has a strong grasp of the basic theories and ideas that serve as bridges between the many scientific fields.[28]

6.1.Lecture Method

Most of the time, the lecture method is used to teach science. It's one of the oldest and most well-known ways to teach. When talking about science education, it is the teachers who explain the different scientific ideas and principles, while the students just listen and try to figure out what they are saying. This way isn't quite right for the real goal of teaching science, but many teachers, both men and women, find that they have to lecture at least 40 to 50 percent of the time. Since the students don't take part in this way of teaching, the teacher is the only source of information in the classroom. This makes this way of teaching teacher-centered and information-controlled.

When there are a lot of people in a class or not enough teaching materials, the only option is to lecture. It's also useful when there aren't enough time slots on the schedule to cover the whole curriculum. People have said that the lecture method meets four main goals.

1. To motivate
2. To clarify
3. To review
4. To expand

6.2.Demonstration Method

A presentation is any way to show or explain how something works or how something happens. Science displays are very useful and teach a lot. This is how both the teacher and the students said what they thought and made comments. Kids get a sense of community in the school when they have these kinds of chances. This approach creates a learning environment where every student

[28] Yadav, Tutorial Instruction in Science Education. 10, no. 2 (1992): 168–79.

has a lot of chances to grow. When the demonstration method is used, the teacher is seen as taking an active role in the learning process. The teacher will often show the class several examples. The students watch and then ask a wide range of questions. They are then asked to explain what the teacher did, which can make them feel like they have to do it right. The teacher asked a lot of different questions about the practice. The teacher is leading a sort of talk in the classroom, and each student will have a chance to speak up and say what they think. Since science is not just about theory, but also involves a lot of hands-on work, this is a great way to make sure that all students understand the basics of the subject. A teacher can show students how things work in the real world by using activities that have worked well in the classroom. When students are given chances to take part in the learning process, they are able to use and improve their powers of observation and thinking. Demonstrations that go well as part of teaching activities give students real-world experience and can be used to organize useful content. In other words:

1. But for a show to work, it needs to have the following qualities: A good demonstration should be visible to all students and the demonstration set up should be at food height for proper visibility.
2. The apparatus should have a blackboard behind the demonstration table to facilitate summarizing the related principles and concepts.
3. To avoid floundering during demonstration, the teacher must arrange the apparatus in proper order.
4. Teachers must give emphasis to the major points in the demonstration to make students aware of the objectives of the demonstration.[29]

[29] Brendzel, "The Use of ICT in Teaching Tertiary Physics: Technology and Pedagogy," Asia-Pacific Forum on Science Learning and Teaching 13, no. 2 (2005): 1–19.

Male and female teachers use demonstration method in a number of ways, because it can be used to serve a number of purposes. It is most suitable for the following purposes:

1. Science demonstrations when prescribed for the first time to a group of students will stimulate their interest and curiosity.
2. Demonstrations in science can be successfully used to make students learn to use and opera science equipment's.
3. Demonstrations can be used to make the students understand the applications of concept ill the effect of light on the doily life
4. Demonstration can help study and solve problems which can be best understood through a versatile demonstration activity by a teacher.
5. Demonstrations can be used as a review technique to summarize a unit which can help to reinforce important ideas. It can be an effective means to summarize key points.

6.3.**Heuristic Method**

The word "heuristic" comes from the Greek *heuriskin,* which meaning "to discover." Professor Armstrong advocated for this method because he knew that putting pupils in the position of a discoverer, rather than a receiver, would lead to greater learning. In actuality, he believed that the way science was being taught fell short of his expectations. He claimed that science education cannot be properly facilitated by using textbooks. In order to learn about and understand the scientific world, students need to make their own, separate efforts to do so.

To paraphrase Armstrong, "*Heuristic method of teaching involves our placing students as far as possible in the attitude of the discoverer, method which involves their finding rather than merely being told about things.*"

The Heuristic method places an emphasis on developing this scientific worldview in the minds of young students. It is considered that every science lesson should be presented to pupils in the form of an enquiry, as its main aim is the discovery of knowledge by arousing the spirit or enthusiasm of discovering and examining the things by self-effort under this technique. Both male and female teachers favor this method.

Teachers employ this method by offering students a problem to tackle and the resources and instruction they need to succeed on their own. Students may be allowed some leeway in how they approach the problem and how they go about solving it. The instructor is there to provide just and helpful guidance.

6.4.Project Method

The project method has students investigate, find out, and learn something they didn't know before. It also puts an emphasis on group work and develops leadership skills. This method is used by teachers, both men and women, because it is based on the following ideas.

1. Loaning by observation
2. Learning, by doing
3. Learning by trial and error
4. Learning by living

Project method of teaching was first introduced by John Dewey. Project is a plan of action which involves a task or problem calling for productive through or action or both on the part of the student.[30]

6.5.Discussion Method

[30] Monika Davar, Teaching of Science (New Delhi: PHI Learning, 2012).

This method of teaching science can be followed in two ways depending upon the time and resources available in a particular institution in a given situation. Both Male and female teachers adopt this method in two ways:

The teacher gives a brief introduction of the topic for discussion followed by supervised study by the pupils in group or individually in the allotted time of an hour or so. The students are allowed to study in the class or may be allowed to go to the library for reference given by the teacher. The students can get their difficulties clarified by the teacher. After the scheduled time, the teacher initiates discussion by posing some questions in logical sequence in the given topic the topic is then covered through discussion with the main points written on the black board.

In the alternate plan, the teacher gives a brief introduction of the topic and explains some new terms. The class divided into convenient groups and is asked to read about the topic with the help of given references. Each group is specially assigned one part of the topic which they have to prepare very thoroughly.[31]

For the success of the discussion method, the teacher should keep in view the following points:

1. The topic for discussion should be chosen with due care and thought. It should be either very simple or very technical.
2. The students should be made clear that they have to study the topic elaborately and pensively from all available resources and references.
3. In order to involve maximum participation, the teacher should see that the discussion is not by one or two students.

[31] Siddique, "Peer Instruction Improves Performance on Quizzes," Advances in Physiology Education 24, no. 1 (2010): 51–55.

4. Teacher has to take care that the discussion focuses on the topic and does not become an event discussion.
5. My point that brings controversy should be settled by the teacher at the proper time class discipline should be maintained.

7. Choosing a Method to Teach

There are some essential way for realizing the group of methods Cot teaching science and procedures for how to select.

1. The method should be able to arouse and maintain interest and enthusiasm to learn.
2. There should be sample opportunities for making use of audio visual, aids while teaching the subject science by the chosen method.
3. The aspects like questioning, discussion, exposition, visits, projects etc. should form a part of science teaching.
4. The method must make the child an active participant in the teaching learning process and he should not merely be a passive listening.
5. The method should help to develop keenness of observation and thinking, cognitional activity and independence of the mind and initiative of the pupils. (Sherman & Scott, 2007)

8. Aids for Teaching Science

Aids of all sorts are meant only to help in teaching and not to act as a substitute for teaching nor to replace the teacher. Aids make teaching realistic and effective and these are meant to supplement the teaching. Since science learning has its basis in first-hand experience of the pupils, so teachers whether male or female should provide those resources and materials were students can see hear, feel, smell and taste.

8.1.Science Exhibition

The school should organize science exhibition periodically and the students should be encouraged to display the projects prepared by them individually or in Group Such exhibitions provide meentives to the pupils scientific projects and to collect material for display pupils, who demonstrate experiments in the exhibition should rehearse and practice beforehand proper follow up activity such as discussion, essay writing, reporting etc increases the value of science exhibition.

8.2.Science Fairs

A science fair is another useful activity for effecting better science instruction. It serves as a fear for display of useful activities carried on in the science club. A science fair also provides an occasion when the parents and the people of the community become acquainted with the school's activities. This creates a consciousness among the people towards science learning. It also serves as a center for dispensing knowledge of science. Moreover, while working and organizing the science fairs, the pupils involved get much help and guidance from teachers, judges, senior students and visitors who might be experts in the field of science.

Here, too, the valuable outcome is the sense of social cooperation in working together. The main objectives of science fair should include:

1. To Provide opportunities to students to witness the achievements of their colleagues and thereby to stimulate them to plan their own projects.
2. To give encouragement and recognition to the bright and energetic students, to have special science talent.

8.3.Science Museum and Biological Garden

A school should also pose a science museum a convenient site should be selected within the school compound for laying a biological garden to contain various types of local plants and also rare plants. It should have a small pond in a corner where fish, toads, frog and other aquatic animals

should be re-read. The presence of rats, rabbits earthworms, lizards, birds etc makes the garden an interesting place for the pupils, various types of flowers and vegetable plants should be grown and the pupils should be trained in taking care for growing them. The pupils should be allowed freedom for selecting and collecting materials for the museum. The science teacher should, with the help of the pupils, arrange the materials systematically and label the specimen clearly.

Elementary science teachers whether they are male or female, selects a particular method based on the needs of the content, teaching facilities available and abilities of the students. They use various aids in order to make their teaching effective.[32]

9. Methodology

Since the main point of the study was to find out how elementary school science teachers do science, a survey research method was used. In the quantitative research paradigm, survey research designs are the best way to describe the views, attitudes, beliefs, self-categorization, knowledge, behaviors, and characteristics of a community. In this study, the group is all first-year science students in Lahore City, and the sample size is 300 people.[33] To make the study more credible and useful, researchers try to find real-life examples of good teaching methods in their samples. Students from both public and private elementary schools, both boys and girls, are in the group so that we can get a more accurate picture of how elementary schools work. The use of a newly made 40-item questionnaire based on a points Likert scale [always = 5, often = 4, sometimes = 3, rarely = 2, never = 1] was confirmed by a pilot study with 10% of the parent group. From what I've read about educational studies, a sample size of 10% of parents is suggested for pilot testing. The survey questionnaire has seven scales, each with five to six questions: lecture, conversation, role play,

[32] Allen M. Schoffstall and Barbara A. Gaddis, "Incorporating Guided-Inquiry Learning into the Organic Chemistry Laboratory," Journal of Chemical Education 84, no. 5 (2007): 848, doi:10.1021/ed084p848.
[33] Yvonna S. Lincoln, Egon G. Guba, and Joseph J. Pilotta, "Naturalistic Inquiry," International Journal of Intercultural Relations 9, no. 4 (1985): 438–39, doi:10.1016/0147-1767(85)90062-8.

inquiry technique, science activities, project-based, and experimentation. The Cronbach's alpha number of 0.95 for this survey questionnaire shows that it is very reliable as a whole. In the next section, we talk about the results of our statistical analysis of the answers to this questionnaire, as well as how we see those findings.

10. Results

Table 1 Frequency distribution of demographic

Gender		Frequency	Percentage
	Male	151	50.3
	Female	149	49.7
Age			
	Up to 13	167	55.7
	13 plus	133	44.3
Sector			
	Public	150	50.0
	Private	150	50.0

Table 1 shows the frequency of demographics, for demographic gender is male (f=151, P=50.3) and female (f=149, P=49.7). For demographic age up to 13 (f=167, P= 55.7) and 13 plus (f=133, P=44.3). for demographic sector public (f=150, P=50.0) and private (f=150, P=50.0).

Table 2 Compare between lecture basis

Gender	N	M	SD	T	Sig
M	151	18.53	5.198	1.42	0.50
F	149	17.85	5.073		

Table no. 4.2 this table shows that an independent-sample t-test was conducted to compare the scores for males and females' lectures. There was no significant difference in males (M = 18.53, SD = 5.198) and females (M = 17.84, SD = 5.073); t = 1.42, p=0.25(two-tailed). It is concluded that the males same as females

Table 3 Compare between demonstration basis

Gender	N	M	SD	T	Sig
M	151	18.87	4.893	-0.07	0.95
F	149	18.91	5.031		

Table no. 3 in this table shows that an independent-sample t-test was conducted to compare the scores for male and female demonstrations. There was no significant difference in males (M = 18.87, SD = 4.893) and females (M = 18.91, SD = 5.031); t = -0.07, p=0.95(two-tailed). It is concluded that the males same as the females.

Table 4 Compare between project basis

Gender	N	M	SD	T	Sig
M	151	15.16	3.580	-0.95	0.30
F	149	15.56	3.789		

Table no. 4 in this table show that an independent-samples t-test was conducted to compare the scores for males and females project. There was no significant difference in males (M = 15.16, SD = 3.580) and females (M = 15.56, SD = 3.789); t = -0.96, p=0.34(two-tailed). It is concluded that the male same as female.

Table 5 *Compare between* discussion *basis*

Gender	N	M	SD	T	Sig
M	151	18.11	5.163	0.08	0.92
F	149	17.55	5.462		

Table no. 5 in this table show that an independent-samples t-test was conducted to compare the scores for males and females discussion. There was no significant difference in males (M = 18.11, SD = 5.163) and females (M = 17.55, SD = 5.462); t = -0.08, p=0.36(two-tailed). It is concluded that the male same as female.

Table 6 *Compare between* laboratory *basis*

Gender	N	M	SD	T	Sig
M	151	14.73	4.031	-0.40	0.50
F	149	14.92	4.218		

Table no. 6 in this table show that an independent-samples t-test was conducted to compare the scores for male and female laboratory. There was no significant difference in males (M = 14.73, SD = 4.031) and females (M = 14.92, SD = 4.218); t = -0.08, p=0.69(two-tailed). It is concluded that the males same as female.

11. Conclusion

As a way for student teachers-to-be to learn how to teach science, I suggested that practical engagement can help students understand and grow their ideas about science. A hands-on, experiential method to teaching makes it easier for people to learn and understand what is being taught. Because of this, it is important for a tutor to understand the subject, use it, and try out different ways to teach it. Elementary school teaching candidates might find it helpful to learn about different points of view and ways to analyze and use the information they have learned.

There is proof that getting students involved in hands-on activities can make them more interested in the subject and help them understand it better. When content and teaching methods are not open to learner-centered activity in science classrooms, the opposite is true. This gives professors an idea of how to train future science teachers who are aware of the challenges of their area but are still interested in it.

12. Discussion

The utilization of scientific methods by science teachers at the elementary level is a crucial aspect of fostering a solid foundation in scientific understanding and critical thinking among young learners. This discussion delves into the significance of these methods in shaping the educational landscape at this formative stage. At the elementary level, science education goes beyond simply imparting facts; it aims to cultivate a curiosity-driven approach to understanding the natural world. Science teachers employ a variety of methods to achieve this goal, ranging from hands-on experiments and demonstrations to interactive discussions and multimedia presentations. These methods serve to engage students actively in the learning process, encouraging them to explore, question, and experiment.

Furthermore, the use of scientific methods equips students with valuable skills that extend beyond science classrooms. By encouraging systematic observation, hypothesis formation, experimentation, and analysis, these methods nurture critical thinking skills applicable to various disciplines and real-life situations. Additionally, they lay the groundwork for developing a strong scientific mindset, fostering traits such as curiosity, skepticism, and the ability to evaluate evidence.

However, the discussion also acknowledges the challenges associated with implementing scientific methods at the elementary level. Limited class time, resource constraints, and varying levels of student readiness can pose obstacles for teachers. Consequently, a delicate balance must be struck between providing enriching learning experiences and catering to the unique needs of young learners.

13. Recommendations

1. The study recommends that parents should play leading role in the educational process of their child since they are first educators of their children.
2. The research also recommends a string parent – teacher partnership for the student's better results
3. Parent should encourage their children to actively participate in academic and nonacademic activities for their better learning
4. Students should be aware new methods of science teaching.
5. Students should adopt those scientific techniques which are delivered by teacher
6. Students should gain advantages of collaborative learning
7. Students should adopt those methods which are making their class sessions more effective
8. Students should be actively involved in their own learning
9. Students should be learned more seriously.
10. Students should be aware more teaching verities.

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