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ATTITUDE OF SCIENCE TEACHER TOWARDS THE USE OF ACTIVE LEARNING METHODS AT THE SECONDARY SCHOOL OF KARACHI

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Abstract

The purpose of this study is to investigate the attitude of science teacher towards the use of active learning methods at the secondary school of Karachi. The qualification of teachers and methods used to teach science will be investigated to suggest solutions to the existing Science teaching learning and students' achievement related problems. Two questionnaires were constructed, one for teachers and other for students used in this research. The teacher questionnaire explores the teachers' attitude regarding the purpose of teaching science, successful teaching learning strategy, resources available, which type of teaching active learning methods are best etc. The student questionnaires explored students' goals and achievements for studying science. Which teaching method was best, which method teacher used in the class, which type of material teacher used in the class, for achievement etc. The creation of those questionnaires is ongoing as of an examination of research variables, as well as developed items linking to these variables. There were 36 teachers in Government secondary schools of Baldia town. The data was analyzed by the sample percentage and Chi squire-test by the application of version 16 statistical package for social sciences SPSS.

Keywords: Teacher, science teacher, active learning, active learning methods and secondary school.

Background of the Study

The aim of this study was to determine the effects of active learning in science education on students' academic achievement and concept learning.

Over the years, scientific educators and researchers have advocated a variety of pedagogical strategies to improve the quality of science teaching and learning (Wahyudin et al, 2024).

Science is the primary topic in elementary education, and it serves as the foundation for both science and technology. Sari, Ahda, Y., and Fitria (2019) argue that science is a field that necessitates hands-on experience in order to obtain a greater grasp of natural phenomena. Science is the primary subject taught in Pakistani elementary schools to help pupils develop scientific attitudes, knowledge, and abilities, as well as love and respect for Allah. Science is not a subject that should be memorized; rather, it allows students to study their surroundings and test their discoveries through experiments, therefore they should focus on actions. Students can be encouraged to be bright and engaged by working through challenges independently and challenging ideas in order to discover better answers for themselves. (Ali et al., 2025)

These include inquiry-based learning, collaborative instruction, technological integration, and culturally relevant techniques, among others. Such tactics encourage active participation, conceptual understanding, and meaningful application of information (Brown, 2017).

Hill, et.al, (2019). However, the effectiveness of these strategies often varies depending on the learners' context, the teachers' pedagogical knowledge, and institutional support. As a result,

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there is an increasing demand for evidence-informed teaching methods that are both flexible and responsive to the evolving needs of learners and the broader society.

Purpose of the Study

The purpose of this study was to investigate.

1. To identify whether the teachers have awareness about active learning methods.
2. To find out how much active learning method used in science classrooms
3. To find out the role of active learning methods in science teaching.

Research Questions

1. Do teachers' have awareness of active learning methods?
2. Do teachers' know active learning method is an important method?
3. Do teachers' use a variety of teaching approaches and techniques?

Hypothesis

1. There is no significant relationship in the student's sequential direction for doing science experiments.
2. There is no significant relationship in the adoption of different teaching strategies and techniques for student's achievement.

Literature Review

Active Learning Methods

Active learning (AL) is a promising alternative to traditional training that has been shown to improve learning outcomes ((Lugosi & Uribe, 2020; Romero-Rodríguez et al. 2024). Further Børte et al. (2023), explained that teacher-centered techniques based on the "transmission model" are ineffective as they only provide a basic comprehension of the subject.

Active Learning is an instructional method that engages students in the learning process. The core elements of active learning include student activity, discussion, and engagement (Prince, 2004) several studies have shown benefits to student attitude, knowledge, critical thinking skills and more when using the active learning method. Active learning leads to better student attitudes and improvements in students' thinking and writing

Activity Based Learning

Activity-based teaching is founded on constructivist theories that encourage interaction, discovery, and meaningful learning activities. Educational researchers believe that pedagogical methods that involve learners in activities such as experiments, projects, group discussions, and hands-on activities help to increase intrinsic motivation and conceptual understanding (Kosar et al., 2024; Sharma, 2025; Riaz et al., 2025). Activity -Based Learning is an umbrella term that alludes to a few models at direction that concentrates the duty of learning on the students (Wikipedia, 2008) activity-Based Learning is a procedure where students actively engage in the lesson rather than just sitting, listening and absorbing the lesson. It is a method of teaching that enables students to be involved in reading, writing, discussion, practical activities, analysis and evaluation of the topic under discussion.

Demonstration Method

Adhikari (2024), A teaching method is the process of providing educational materials and lessons in order to achieve the targeted objectives. There are different educational methods. One such way is the demonstrative method, which uses visual aids such as flip charts, posters, and PowerPoint presentations to communicate an idea. The demonstration approach involves presenting something while offering proof and evidence of its content. In teaching and learning, the demonstration approach is characterized as presenting a demonstration or carrying out a specific task.

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What are Attitudes?

Attitudes have been classified in a number of ways that overlap (for example, Eagly and Carli, 1981; Petty and Cacioppo, 1981). Maio et al. (2019) defined attitude as "an overall evaluation of an object that is based on cognitive, affective, and behavioral information" (p. 4). Fleck (2015), After experimenting with other fields of language use, Attitude adopted the vocabulary of the social and behavioral sciences early in the twentieth century. Looking back at the concept's origins exposes some of the benefits and drawbacks it eventually faced. Unlike many other social science ideas, the word 'attitude' existed in more than one Indo-European language in the same form before being adopted by the social sciences: attitude in Italian, initially in French, and subsequently in English.

Research Strategy

The present study will be conducted by survey method. Quantitative method of research will be used for collecting data into pure sciences. This plan is additional capable at the same time as compare near further investigational design, while it manages to eliminate irrelevant variables.

Independent Variable

Following is the independent variables for the study

- Science teachers

Dependent Variable

Following is the independent variables for the study

- Use of active learning methods

Population

There are four secondary schools for boys and girls in Baldia Town Karachi, Sindh Pakistan. All science teachers and students (male and female) of secondary school of Balida town Karachi Sindh (Pakistan) were population of this Survey study.

Sampling

There were 36 teachers in Government secondary schools of Balida town was the part of study.

Questionnaires & Data Collection

Questionnaire was constructed for the data collection purpose from the secondary schools Teachers of Baldia town. The questionnaire explore the teachers' attitude regarding the teaching science.

Data Analysis

In order to find out the science teaching methodology and attitude towards science teachers, the sample percentage and Chi squire-test was used. The null hypotheses were accepted or rejected on base of contrast of Chi squire-calculated and tabulated values. The data was analyzed by the application of version 16 statistical package for social sciences SPSS.

Result Analysis

Science is primarily a formal way of representing the real world.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Undecided	1	2.6	2.8	2.8
	Agree	24	63.2	66.7	69.4
	Strongly agree	11	28.9	30.6	100.0
	Total	36	94.7	100.0	
Missing	System	2	5.3		

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Total	38	100.0		

Table 4.1

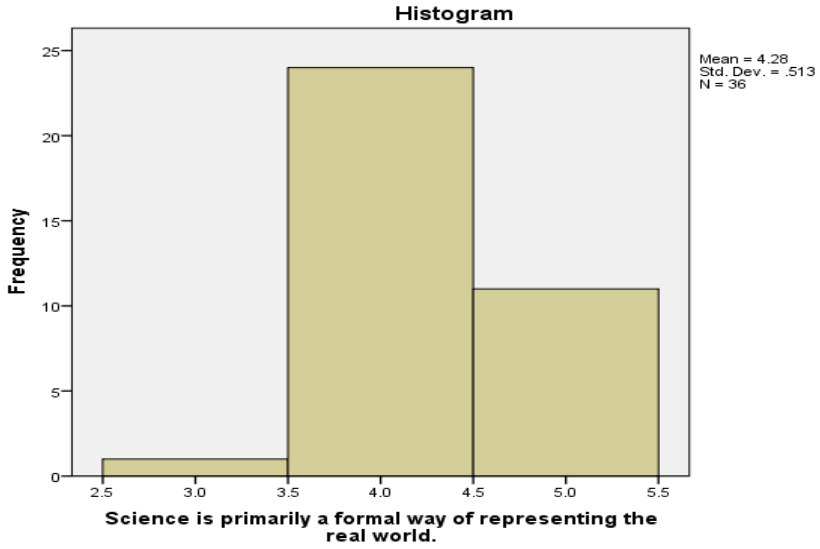

Figure 4.1

In item no. 01 respondents mostly answered is agree and according to these answered we can say that science is representing the real world.

In your class students work in group.					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Disagree**	1	2.6	2.8	2.8
	Undecided	7	18.4	19.4	22.2
	Agree	16	42.1	44.4	66.7
	Strongly agree	12	31.6	33.3	100.0
	Total	36	94.7	100.0	
Missing	**System**	2	5.3		
Total		38	100.0		

Table 4.3

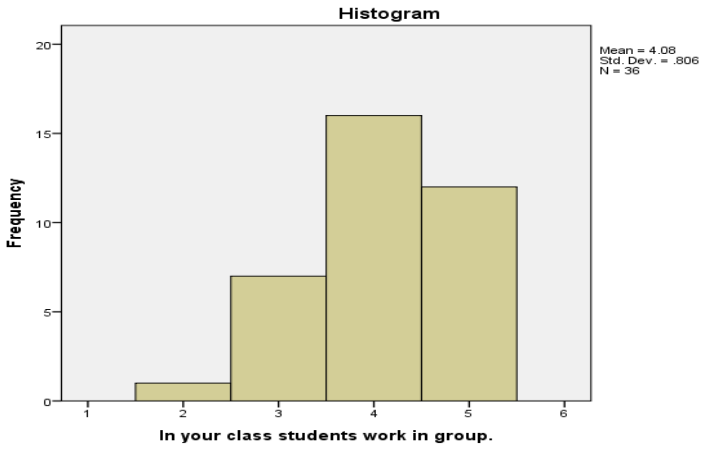

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Figure 4.3

In item no. 3 according to these answered mostly respondents answered is agree we can say that in science class students work in group.

When science activities are too difficult, I give up or only do the easy parts.					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Strongly disagree**	3	7.9	8.3	8.3
	Disagree	3	7.9	8.3	16.7
	Undecided	1	2.6	2.8	19.4
	Agree	14	36.8	38.9	58.3
	Strongly agree	15	39.5	41.7	100.0
	Total	36	94.7	100.0	
Missing	**System**	2	5.3		
Total		38	100.0		

Table 4.5

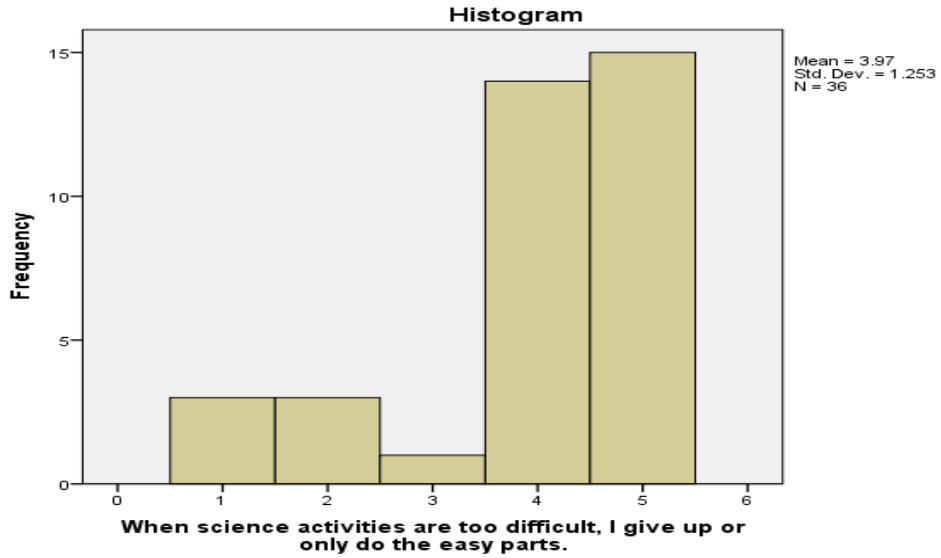

Figure 4.5

In item no. 5 respondents answered is agree that science activities are difficult then teacher do the easy

When I find the science content difficult, I do not try to learn it.				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**

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Valid	Strongly disagree	4	10.5	11.1	11.1
	Disagree	2	5.3	5.6	16.7
	Undecided	2	5.3	5.6	22.2
	Agree	20	52.6	55.6	77.8
	Strongly agree	8	21.1	22.2	100.0
	Total	36	94.7	100.0	
Missing	System	2	5.3		
Total		38	100.0		

Table 4.6

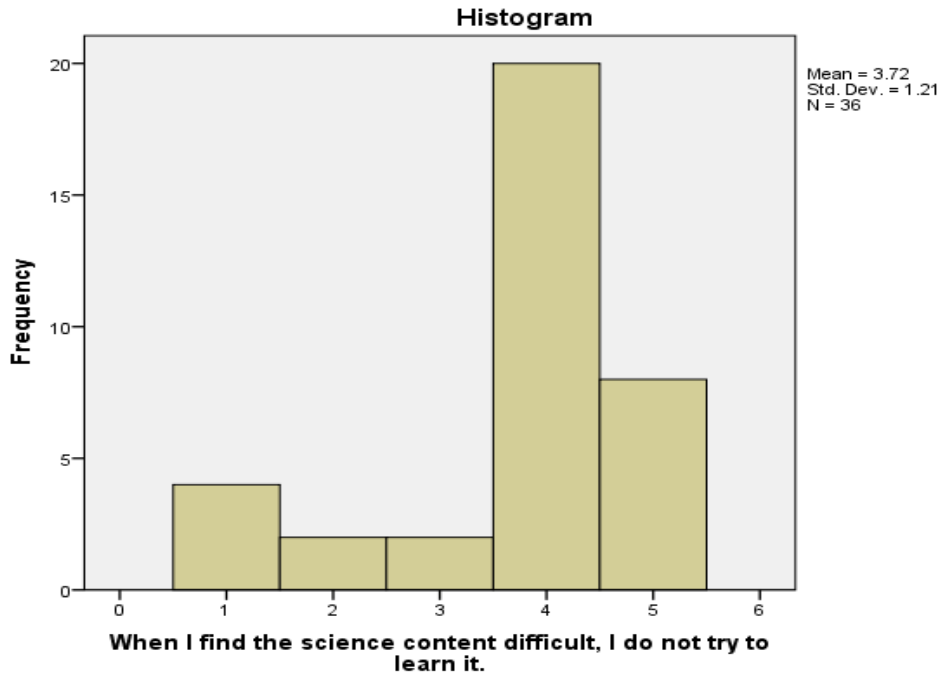

Figure 4.6

In item no. 6 mostly respondents answered is agree according to theses answered we can say that when science content is difficult teacher to do not try to learned it.

When learning new science concepts, I attempt to understand them.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Undecided	2	5.3	5.6	5.6
	Agree	21	55.3	58.3	63.9
	Strongly agree	13	34.2	36.1	100.0
	Total	36	94.7	100.0	

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Missing	**System**	2	5.3		
Total		38	100.0		

Table 4.7

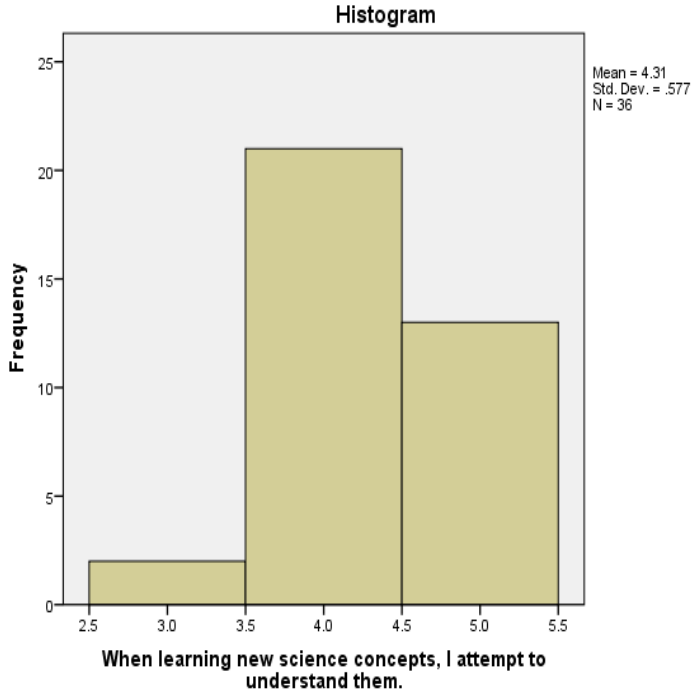

Figure 4.7

In item no. 7 mostly answered is agree according to these answered we can say that when learning new science concept teacher attempt to understand them.

When learning new science concepts, I connect them to my previous experiences					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Undecided**	5	13.2	13.9	13.9
	Agree	16	42.1	44.4	58.3
	Strongly agree	15	39.5	41.7	100.0
	Total	36	94.7	100.0	
Missing	**System**	2	5.3		
Total		38	100.0		

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Table 4.8

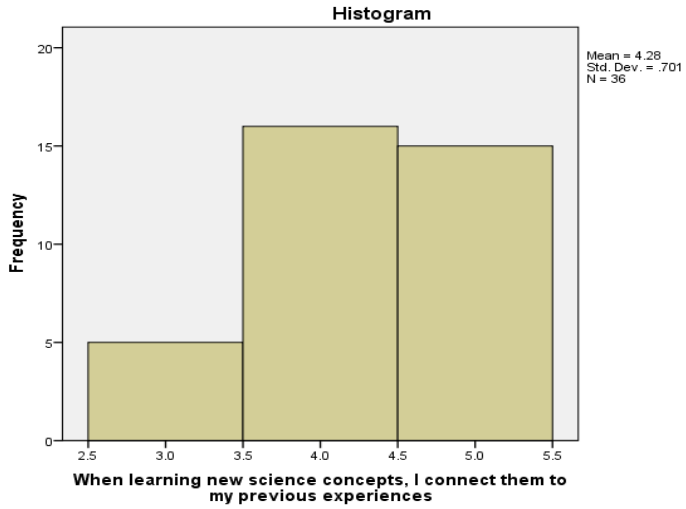

Figure 4.8

In item no. 8 respondents answered is agree according to these answered we can say that learning new science concept teacher connect to previous experiences.

When I do not understand a science concept, I find relevant resources that will help me.					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Undecided**	4	10.5	11.1	11.1
	Agree	19	50.0	52.8	63.9
	Strongly agree	13	34.2	36.1	100.0
	Total	36	94.7	100.0	
Missing	**System**	2	5.3		
Total		38	100.0		

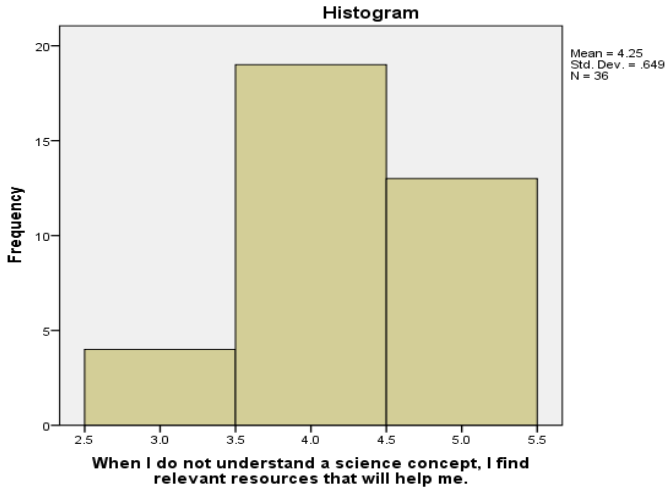

Table 4.9

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Figure 4.9

In item no. 9 respondents answered is agree according to these answered we can say that when do not understand the science concept teacher find relevant sources that will helped them.

It is important for teachers to give students prescriptive and sequential directions for doing science experiments.					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Undecided**	4	10.5	11.1	11.1
	Agree	21	55.3	58.3	69.4
	Strongly agree	11	28.9	30.6	100.0
	Total	36	94.7	100.0	
Missing	**System**	2	5.3		
Total		38	100.0		

Table 4.11

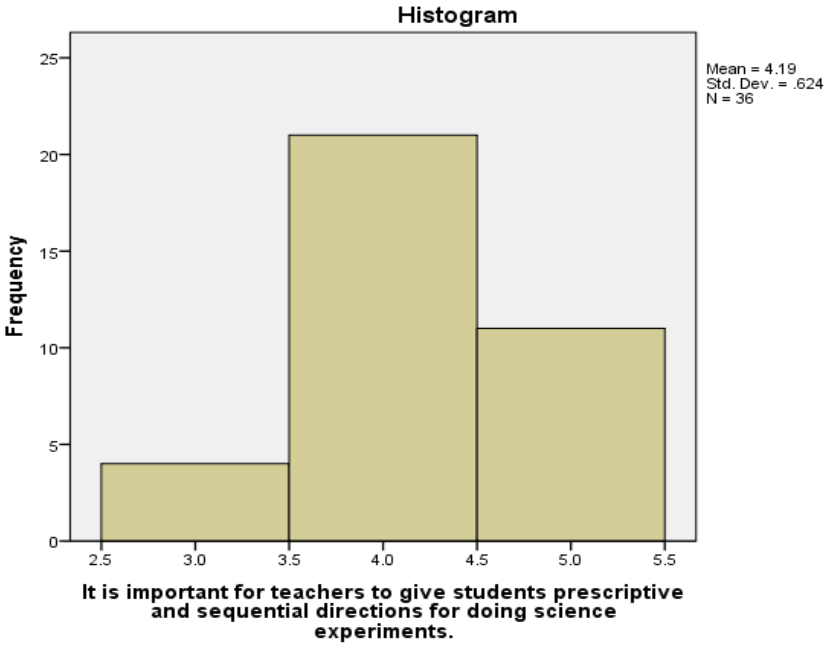

Figure 4.11

In item no. 11 respondents answered is agree we can say that it is important for teachers to give direction for doing science experiment.

If students get into debates in class about ideas or procedures covering the sciences, it can harm their learning.				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**

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Valid	Strongly disagree	2	5.3	5.6	5.6
	Disagree	3	7.9	8.3	13.9
	Undecided	2	5.3	5.6	19.4
	Agree	14	36.8	38.9	58.3
	Strongly agree	15	39.5	41.7	100.0
	Total	36	94.7	100.0	
Missing	System	2	5.3		
Total		38	100.0		

Table 4.12

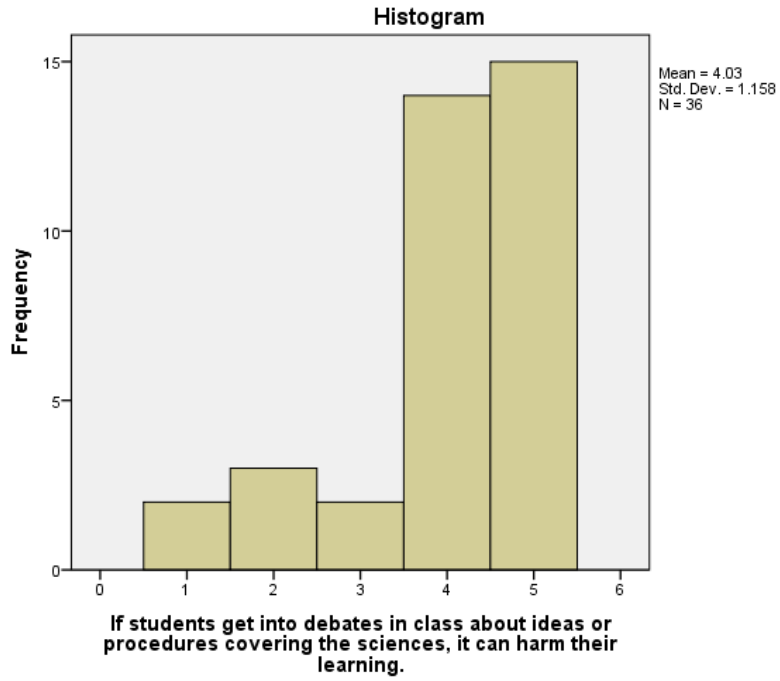

Figure 4. 12

From above answered we can say that if student get into debates in the class about idea then make the successes full learning.

Science teacher adapts different teaching strategies and techniques for student's achievements.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	5.3	5.6	5.6
	Undecided	1	2.6	2.8	8.3
	Agree	17	44.7	47.2	55.6
	Strongly agree	16	42.1	44.4	100.0
	Total	36	94.7	100.0	

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Missing	**System**	2	5.3		
Total		38	100.0		

Table 4. 17

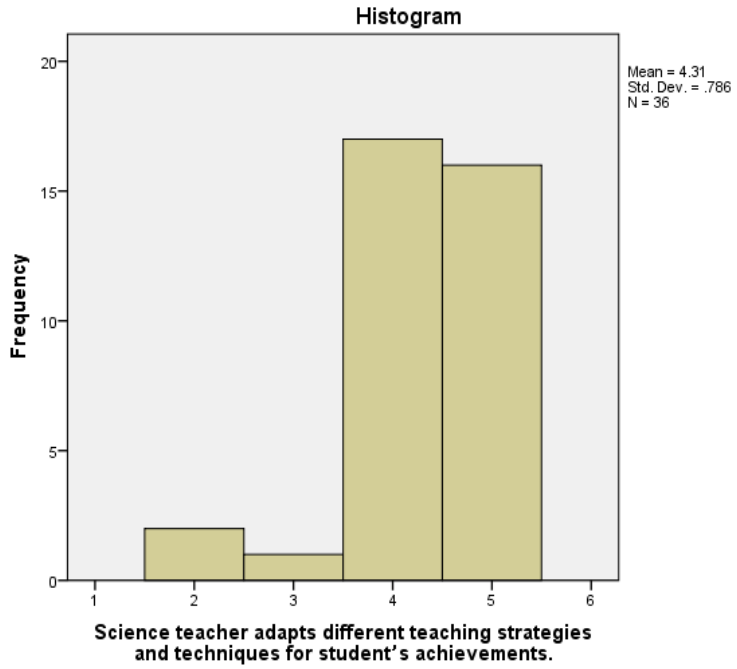

Figure 4. 17

In item no. 17 mostly respondents answered is agree so we can say science teachers adapt different teaching strategies for students' achievements.

Whole class participates in science class.					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Disagree**	2	5.3	5.6	5.6
	Undecided	11	28.9	30.6	36.1
	Agree	13	34.2	36.1	72.2
	Strongly agree	10	26.3	27.8	100.0
	Total	36	94.7	100.0	
Missing	**System**	2	5.3		
Total		38	100.0		

Table 4. 18

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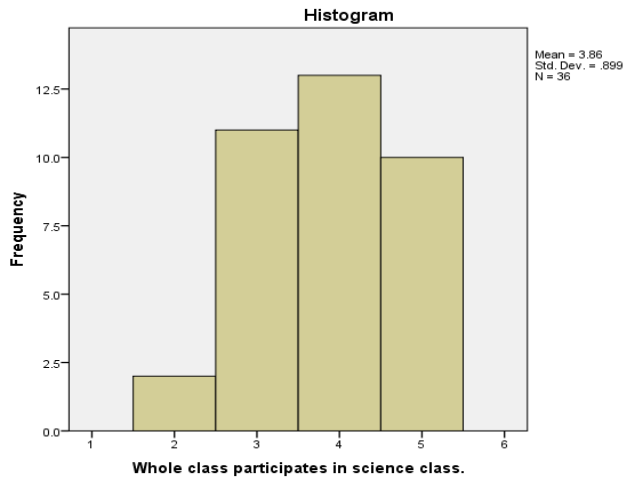

Figure 4. 18

In item no. 18 respondents answered is agree then we can say that whole class participate in science class.

It is necessary for effective science teaching Methodology focusing on idea.					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Disagree**	1	2.6	2.8	2.8
	Undecided	2	5.3	5.6	8.3
	Agree	24	63.2	66.7	75.0
	Strongly agree	9	23.7	25.0	100.0
	Total	36	94.7	100.0	
Missing	**System**	2	5.3		
Total		38	100.0		

Table 4. 19

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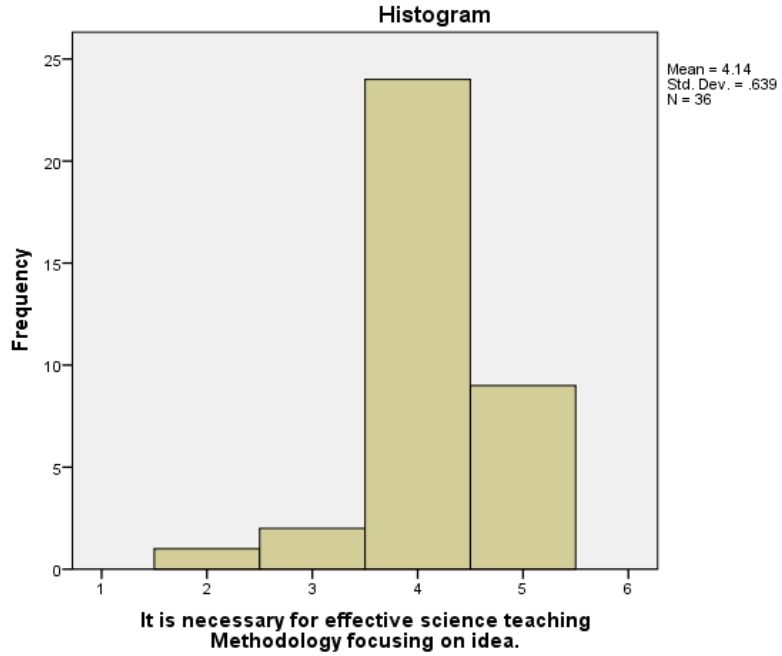

Figure 4. 19
In item no. 19 respondents answered is agree we can say that it necessary for effective science teaching methodology focusing on idea.

FINDINGS

Significant findings of contemplate drawn out starting with those hypotheses. Teacher and student's findings are given under.

Teacher's Hypothesis

1. There is significant relationship in the student's sequential direction for doing science experiment.
2. There is significant relationship in the adoption of different teaching strategies and techniques for student's achievement.

Conclusion

- In this study has shown result that effective science teaching is based on topic. But with respect to student's response that linking of topic to other topic is directly related to effective science teaching.
- Mostly respondents answered that teachers used different strategies and methods for student's success. If students don't understand the topic teacher used alternative examples and explanation that students easily understand them.
- A mostly teacher says students don't understand the topic or any experiment that provide direction for doing science experiment.
- Learn new concept connect with the previous concept with respect to the students understanding.

Recommendation

The teacher should have to teach students with sequential direction.
To appoint a teacher it is important that teacher is well qualified and expert in science.

The government should take step to provide a material and other experimental instrument and place where student learn science easily.
The teacher should teach science to student with linking of one topic to other topic.
It is very important for teachers to teach students in their I Q level and mind set.
The government should provide all accessories to science student like libraries.
The school should aware students with new technology and devices.

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