A Comparative Study of Constructivist and Traditional Methods of Teaching Science to Grade V, Primary Level Public School of District Korangi, Karachi

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Abstract

Constructivist teaching approach is beneficial for effective and long-lasting learning of students especially in young children. The current study was conducted to identify the effect of constructivist teaching approach on fifth-grade students' science achievement. Convenient sampling technique was used to select 30 fifth grade students at a public primary school in district Korangi, Karachi. Data was collected with a self made test. SPSS software was used to analyze the data collected from respondents. Experimental pre-test post-test design was used to check the effectiveness of constructivist teaching approach on students' achievement in science subject. The results illustrated that constructivist teaching approach improved students' achievement in science. In order to have effective learning for students there is a need to transform the old style of teaching into an innovative and constructive one. Therefore, the researcher utilized activity-based learning approach to foster the students' learning. Two-way communication between a teacher and the students provides a baseline for activity-based learning. The findings of the current study highlighted the importance of innovating teaching methodology like activity-based learning that significantly proves beneficial in improving the students' science achievements. It also reflected that the activity-based teaching methodology helped the students perform better than the students who taught with traditional methods.

Keywords: *Constructivist Teaching Approach, Traditional Teaching Approach*

Introduction

The constructivist teaching approach is considered the most feasible to cope with the modern trend of the present era, that not only focuses on moral building of students along with the flourishing concept of creative thinking but also promotes knowledge acquisition among students. It concerns with understanding how people perceive a concept or become able to learn. This school of thought encourages active learning among students by constructing their concepts effectively (Ayaz & Sekerci, 2015). According to this school of thought, the construction of students' knowledge is based on their own experiences and associated with the environment where they have experience (Noureen, Arshad, & Bashir, 2020). Constructivist approach gives liberty to students to construct their own concepts of reality whether they perceive it as objective or subjective (Juvova, Chudy, Neumeister, Plischke, & Kvintova, 2015). The process of constructing and learning is carried on continuous basis while involved in negotiation with society members. During interaction with others, they perform many things like: develop new concepts, testing previous ones (Qarareh, 2016). Teachers help students develop their personalities by playing the role of moderator between the education system and students (Holt-Reynolds, 2000). For this purpose, teachers plan their lessons as per students' interests and requirements of topic and needs of students. In this regard, they encourage their students to ask questions that help construct the new information correctly (Adom, Yeboah, & Ankrah, 2016; Kim, 2005).

Background

The traditional teaching approach; teacher centered method of teaching i.e. lecture method mostly used in schools at primary level in Pakistan (Khalid & Azeem, 2012). In the traditional method of teaching in our classrooms preference is given to the completion of content without bothering the students' interest (Khalid & Azeem, 2012), where students just practice rote learning rather than having creative thinking. The prevalence of students' passiveness environment the questioning from students is mostly discouraged (Adak, 2017). To cope with the needs of the modern era, adaptation of innovative teaching and learning strategies, students' active involvement in different activities are must (Farooq, Tatlah, & Butt, 2020).

Purpose of the study

Activities prove beneficial for effective and long-lasting learning of students especially in young children. Considering this concept that we observed over routine life, the researcher becomes curious to find a teaching methodology that proves beneficial for students' better achievement. Either the traditional style of teaching is fruitful, or constructivist teaching approach is better. In order to find out the answer of this question the researcher conducted this experimental study to identify the effect of constructivist teaching approach on fifth-grade students' science achievement.

Objective of the study

This research study was conducted to determine the effects of constructivist teaching approach on fifth-grade students' science achievement.

Research hypothesis

In the alignment of objective of this research study following three research hypothesis were formulated:

1. **H_0 1:** There is no mean score difference between experimental and control group students' science achievement at the time of pre-test.
2. **H_0 2:** There is no mean score difference between experimental and control group students' science achievement at the time of post-test.
3. **H_0 3:** There is no mean score difference between girls and boys science achievement at pre-test of experimental and control group.
4. **H_0 4:** There is no mean score difference between girls and boys science achievement at post-test of experimental and control group.

Literature Review

Teachers plan their lectures and make decisions to deliver their lectures that improve students' learning and development by boosting their motivation to learn with the utilization of constructivist approach (Fernando & Marikar, 2017). It reflects that classrooms where teachers practice constructivist teaching approach are beneficial for students' learning in combination of other abilities (Adom et al., 2016; Hirumi, 2002). For instance, ability to solve their own problems, attitude towards science, sense of creativity, ability to take good and on time

decisions, and many other such abilities are essential to be a constructivist teacher (Bada & Olusegun, 2015; Duit, 2016).

For a long time, learning theory and research have served as foundations for understanding in education and psychology. There are mainly three learning theories. These are; Behaviorism, Cognitive Constructivism and Social Constructivism. Here as objective is to compare the traditional teaching approach with constructive approach, so, just the Cognitive Constructivism and Social Constructivism are discussed here.

Constructivism: According to Cherry (2022) constructivism is a learning philosophy that holds that knowledge is not something that can be simply handed to pupils in their desks by the instructor at the front of the class. Conversely, learners generate knowledge actively, through an intellectual developmental process; students are the constructors and producers of interpretation and understanding. Constructivism is based on the developmental studies of Piaget (1977) and Kelly (1991) further William G. Perry introduced adults' mental and intellectual evolution.

Cognitive Constructivism

Jean Piaget (1977) : Piaget worked upon children's' construction of reality in 1957 (Piaget, 1957). According to Piaget (1977) learning happens through active meaning creation rather than passively recipient. He argues that when learners come across an event or a circumstance that contradicts our present method of thinking, learner enters a condition of disharmony or disparity. To regain harmony or equilibrium, learner must first change their way of thinking. To accomplish this, they strive to absorb additional knowledge into current knowledge by linking it with what they already know. When this is not possible, they adjust the additional information to previous style of thinking by re-organizing current information to a more advanced level of reasoning (Cherry, 2022)

William G. Perry (1968): William G. Perry in the 1950s and 1960s extended Piaget's work to create a more comprehensive picture of teenage development (Tracy, 2021). Furthermore, he rejects Piaget's definition of a stage and introduces the concept of positionality and offers a less static view of developmental processes. The developmental process, he believes, is a never-ending series of changes between distinct perspectives. Perry accepted Piaget's assumption that individual adapt and develop by assimilating and accommodate new content into previous

conceptual systems. He also agreed with Piaget's cognitive theory. He does, however, highlight the notion that learners acquire knowledge and interpret the world from a different perspective (Cherry, 2022).

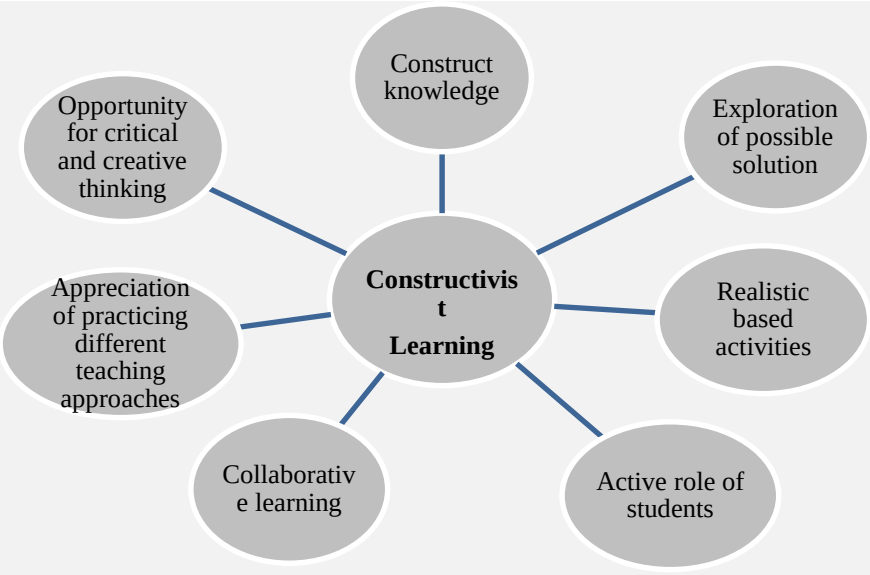
Kelly (1991): Kelly's notion of personal constructions is similar to Piaget theory (Kelly, 1991). Kelly suggests that we perceive the world through mental constructions or patterns that we make for ourselves. Based on our experiences, we construct or perceive the world in new ways. When we meet a new event, we try to fit these patterns around it. For example, we all know that we are expected to stop when we see a red traffic light. The point is that we develop our own perspectives on the world in which we live; the world does not (Gray, 2019; Cherry, 2022).

Social constructivism: Vygotsky the social constructivism's founding father was not agreed with Piaget and Perry, who detached learning from social interaction. He believed that intellectual processes originate interpersonal contacts. He also defines learning as outcome of social interaction Vygotsky, (1978) thought that social connection was an important aspect of learning. Social constructivism is founded upon learner's interpersonal relationships during learning and also personalized analytical thinking (Vygotsky & Cole, 2018; Cherry, 2022).

Implications of social constructivism for teaching: Gray (2019) also stated that constructivist classrooms are designed to involve students in encounters that allow them to participate in purposeful investigation, activity, creativity, creation, communication, theorizing, and deep introspection. The basic role of instructor is to foster cooperative and brain-storming to make students engaged actively to learn. An instructor is more like a facilitator of learning than an educator. Instructors aim to attempt to (1) comprehend children's thinking, (2) encourage children's constructive learning and knowledge, (3) promoting learner's cooperation. The objective is to create a participatory classroom atmosphere that offers worthwhile learning opportunities to self-directed learners (Gray, 2019).

Theoretical framework of study: The theoretical framework of study is based on Bada and Olusegun’s (2015) goals of constructivist classrooms. Bada and Olusegun’s constructivist classrooms goals are founded in social constructivism of Vygostsky. The constructivist classroom focus is shifted from the teacher to the students in an organized way to promote interactive classrooms. The students performed actively rather than passive participation. The teacher foster, facilitate and assist their students.

Figure 1.
Goals of constructivist classrooms by Bada &Olusegun (2015).



The figure 1 presents the goals of constructivist classrooms by Bada and Olusegun. According to them constructive learning consisted of seven factors. These factors are active role of students, constructing knowledge, collaborative learning, opportunity for critical and creative thinking, appreciation of practicing different teaching approaches, realistic based activities, and exploration of possible solution.

Researches on constructivist learning: Constructivist classroom have environment where students correct their previous concepts after testing them in the light of new experiences (Yaduvanshi & Singh, 2015). Teachers also help them to rethink and ask questions to clear their concepts if they have any sort of ambiguity. There students are active rather than teachers, as they have to play the role of facilitator and guide the students (Ayaz & Sekerci, 2015; Caliskan, 2015).

Discussion is organized in such a way where students raise the question to their teachers and group fellows as well. Final agreed answer is shared with whole class. They develop their own ideas and understanding relevant to subject which they are learning based on their own knowledge and experience. At that time, if the new information is contradictory to the knowledge that they previously have, they are persuaded to rectify that piece of information (Alanazi, 2016).

Creativity and critical thinking among students can't be flourished in this sort of atmosphere. One of the reasons behind this ignorance believing that students have the capacity to equally learn the content, there is no individual difference among them (Emaliana, 2017).

Adak (2017) used a constructivist method to investigate the science achievement of 58 9th grade students in an experiment. According to the results of that experimental investigation, pupils who participated in the constructivist 7E-model fared better. Nonetheless, they achieve mastery at a greater cognitive level than those who were not.

Gupta (2017) stated that constructive method is the finest ever strategy for child cognitive development. It generates thought process. The constructivist method is according to the learning psychology of children. It helps students in brain storming and get them frees of rote learning. It stimulates children to engagement in their education.

In classroom where students are active great consideration is given to students' interest and their cognitive level. In order to have productive outcome and learning of students even though they are working in small groups setups. They have the liberty to reach their own conclusion after working with their mates to experience the new horizon that help to develop their own understanding about the content (Emaliana, 2017; Kaymakamoglu, 2018; Keiler, 2018).

Kaymakamoglu (2018) observed that traditional classroom, there teachers have the authority to deliver the lecture without considering the students' interest. In such authoritative classroom environment teachers always remain dominant. Followers of this school of thought believe that knowledge is based on concrete and permanent concepts. Students just have to learn them, without having the opportunity to argue their teachers to develop better understanding. In such particular environment of teaching and learning students remain passive and discouraged to ask questions. Vintere (2018) also stated that constructivist approach for teaching Maths improves capabilities of students that are required for sustainable development.

Albadi also intended to inquire the effect of activity-based learning in 2019 by deviating from the traditional mode of learning in the classroom on students' achievement. Twenty four boys students, enrolled in 12^{th} grade in one of the public schools of Oman were the sample of the study. The results of study show that activity-based learning is beneficial for students' biology achievement.

Anwer (2019) carried out a study upon 120 higher secondary school students and found that activity based learning has a favorable influence on student's motivation and academic accomplishment at the higher secondary level. It also promotes higher level thinking.

Experimental research done by Noureen et al. (2020) demonstrates the efficiency of the constructivist approach vs. the lecture technique at the classroom level. Results show that the constructivist approach teaching method caused better achievement than teaching by traditional methods. This study was carried out on a sample of 7th grade 60 pupils.

Gap in Study : According to the aforementioned studies, which were conducted to determine the effectiveness of the constructivist approach versus the lecture method, a gap was found in the literature. For example, Alanazi in 2016 carried out a study but the focus was on teaching methodologies rather than the effects of constructive teaching. Adak and Gupta conducted studies on the subject of science to investigate constructive teaching effectiveness but afterward, no study was conducted to investigate the constructive teaching effectiveness in the subject of science at the international level. Ahmad, Khan, Ali, Islam, and Saeed conducted a study in 2021, but the focus was to determine the current condition regarding teaching methodology at the school. Furthermore, the research was qualitative in nature and eight primary school teachers were sampled to explore the current teaching methodologies in the schools. Another study was conducted by Shah in 2019, but the focus was the misuse of constructivist teaching. Also, both international and Pakistani research studies had w sample of university students, and elementary and secondary students, but no study was conducted at the primary level. Thus, this study was conducted to highlight the importance of determining the impact of constructivist teaching methods on fifth-grade students' achievement in the subject of science.

Research Methodology

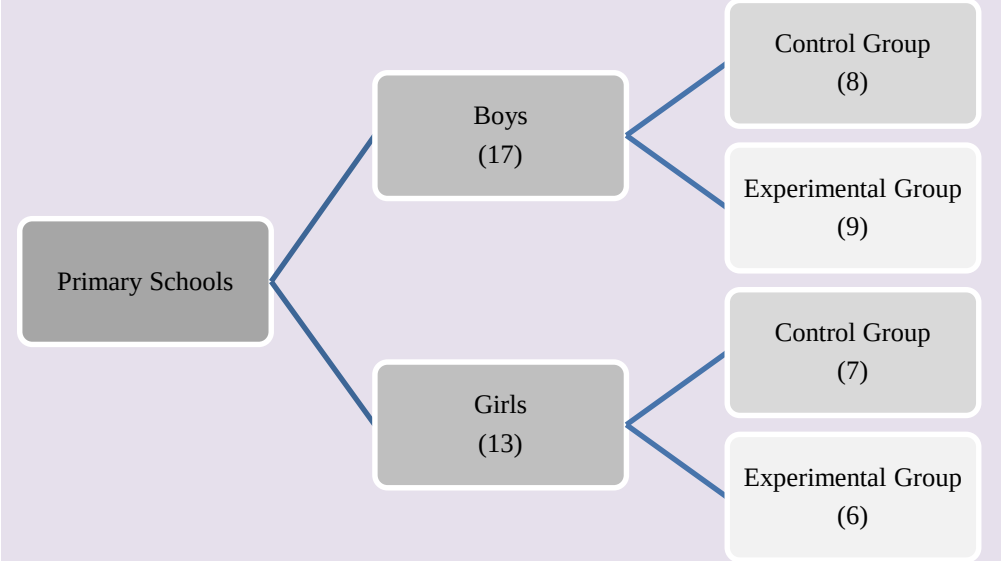
The quantitative approach with true experimental pre-test and post-test design was used to investigate the effectiveness of the constructivist teaching approach. Experimental research design served best to estimate the cause-effect relation (Wharrad & Silcocks, 2009). In such a design, the researcher manipulated the teaching method in order to check the constructivist teaching approach's effect on students' achievement in science subjects.

Instrument :A self-made instrument was used for data collection in the study. The researcher developed an achievement test based on the content that was taught throughout the intervention.

The same test was used to collect the data before and after the intervention, as a pre-test and post-test to assess the student's achievement in science.

Sample and sampling techniques: The population of the study consisted of primary schools of the district of Korangi, Karachi. The convenient sampling techniques were used to reach the participants of study, as it is helpful for research having a short duration of time (Saunders, 2012). Two schools were selected for intervention; one boy and one girl primary school. The sample consisted of 30 students (girls and boys) of grade V. Students divided into two groups; experimental and control. There were 15 students in each group; 9 boys and 6 girls in the experimental group, and 8 boys and 7 girls in the control group.

Figure 2
Sample of the study.



Intervention and data collection procedure

Permission was sought before collecting the data from the head of the school. The researcher herself explained the purpose of the research to all participants and their teachers. A section of grade five was selected randomly with the help of balloting and split into two groups (experimental and control). Experimental group students were taught through constructivist teaching approach which is activity-based learning method. While there was no change in the teaching learning process of students who belonged to the control group. They were taught through a lecture method. The intervention was remained continue for two months, 6 days in a week. Duration of intervention for each class was 45 minutes.

The self-made test was used to collect the data from all respondents either belonging to the experimental or control group. All the participants of the study were facilitated with sufficient time to answer the test.

Discussion and Analysis

In order to analyze the collected data, the researcher incorporated inferential statistics; an independent sample *t*-test as well a dependent sample *t*-test, to highlight the mean difference in the scores for both experimental and control group students.

Demographic details of participants

In the section below the demographical information of the participants is given.

Table1
Demographic Details of the Experimental Group of Students

Respondents		Frequency	Percentage %
Gender	Boys	9	60.0
	Girls	6	40.0

The demographic details of the experimental group of students are presented in Table 1. It shows that there were 9 boys (60.0%) and 6 girls (40.0%) in the experimental group. The figure below shows the same percentage of gender analysis.

Figure 3.

Percentage for gender analysis for experimental group

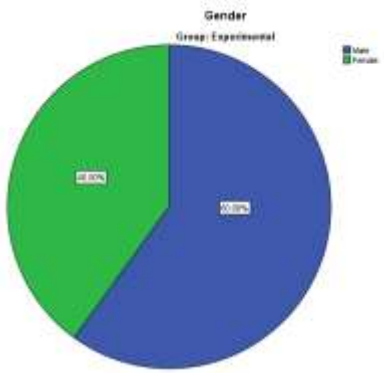


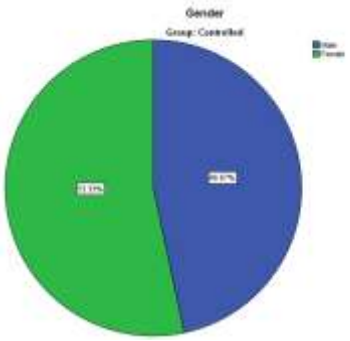
*Figure 3.*Percentage for gender analysis for experimental group. There were 60.0% of boys and 40.0% of girls in the experimental group.

Table 2
Demographic Details of the Control Group Students

Respondents		Frequency	Percentage %
Gender	Boys	8	53.3
	Girls	7	46.6

The demographic details of the control group of students are presented in Table 2. It shows that there were 8 boys (53.3%) and 7 girls (46.6%) in the control group. The figure below shows the same percentage for gender analysis.

Figure 4
Percentage for gender analysis of control group



There were 53.3% of boys and 46.6% of girls in the control group.

Analysis of the data

H_0 1: There is no mean score difference between experimental and control group students' science achievement at the time of the pre-test.

Table 3
Comparison of Experimental and Control Group Students' Science Achievement in Pre-Test

Group	N	M	SD	T	df	p	D	95% CI	
								Lower	Upper
Control	15	9.93	3.751	.667	28	.510	.244	-2.07	4.070
Experimental	15	8.93	4.431						

*p < .05

In the aforementioned table, the results of the independent sample t-test were utilized to find out the difference in the results of students who either belonged to the experimental or control group concerning science subjects. These results illustrated that at the time of the pre-test students of

both groups were equally inclined toward science as there is no significant difference in their results. As the mean value of the control group (M = 9.93, SD = 3.751) is not significantly higher than the mean value of the experimental group (M = 8.93, SD = 4.431). Moreover, t = .667 and p = .510, considering these results it is concluded that the mean difference at the time of the pre-test between control and experimental groups is not significant.

Therefore, the first null hypothesis "There is no mean score difference between the experimental and the control group students' science achievement at the time of pre-test" is failed to reject, as results displayed in the above table are evident that students either belonged to experimental group or control group equally had understandings about the concepts of science subject.

H_0 2: There is no mean score difference between experimental and control group students' science achievement at the time of the post-test.

Table 4
Comparison of Experimental and Control Group Students' Science Achievement in Post Test

Group	N	M	SD	T	df	p	D	95% CI	
								Lower	Upper
Control	15	17.93	5.55	-2.45	28	.021	-.90	-2.07	4.07
Experimental	15	22.87	5.46						

*p < .05

The aforementioned table depicted the results of the independent sample t-test to find out experimental or control group students' results in subject science. These results reflect that at the time of the post-test students' experimental groups were more inclined toward science as there was a significant difference in their results. As mean value of experimental group (M = 22.87, SD = 5.46) is significantly higher than the mean value of control group (M = 17.93, SD = 5.55). Furthermore, with t = -2.45 and p = .021, considering these results it is concluded that the mean difference at the time of post-test between control and experimental groups is significant.

Hence, the second null hypothesis "There is no mean score difference between experimental and control group students' science achievement at the time of post-test" is rejected. As the results displayed in the above table are evident that students belonging to the experimental group improved their achievement in science by performing better than the control group students in the post-test.

H_0 3: There is no mean score difference between girls and boys science achievement during pre-test of experimental and control group

Table 5
Comparison of Boys and Girls Students' Science Achievement in Pre-Test of Experimental Group

Gender	N	M	SD	t	df	p	D	95% CI	
								Lower	Upper
Boys	7	7.00	4.62	-1.68	13	.117	-.87	-8.29	1.04
Girls	8	10.63	3.74						

*p < .05

In the aforementioned table, the results of the independent sample t-test were displayed that were utilized to find out the difference in the scientific achievement of students of the experimental group in the pre-test with regards to their gender. These results illustrated that at the time of the pre-test both boys and girls students were equally inclined toward science as there is no significant difference in their results. As the mean value of girls students (M = 10.63, SD = 3.74) is not significantly higher than the mean value of boys students (M = 7.00, SD = 4.62). Moreover, t = -1.68 and p = .117, considering these results it is concluded that the mean difference at the time of pre-test between boys and girls students is not significant.

So, the fifth null hypothesis "There is no mean score difference between girls and boys science achievement at the pre-test who belongs to the experimental group" fails to reject. As the results displayed in the above table are evident that both boys and girls students equally had an understanding of the science subject.

Table 6
Comparison of Boys and Girls Students' Science Achievement in Pre-Test of Control Group

Gender	N	M	SD	t	Df	p	D	95% CI	
								Lower	Upper
Boys	9	9.33	3.04	-.75	13	.469	-.39	-5.84	2.84
Girls	6	10.83	4.79						

*p < .05

In the aforementioned table, the results of the independent sample t-test were displayed that was utilized to find out the difference in the scientific achievement of students of the control group in the pre-test with regards to their gender. These results illustrated that at the time of the pre-test both boys and girls students were equally inclined toward science as there is no significant

difference in their results. As the mean value of girls students (M = 10.83, SD = 4.79) is not significantly higher than the mean value of boys students (M = 9.33, SD = 3.04). Moreover, t = -.75 and p = .469, considering these results it is concluded that the mean difference at the time of pre-test between boy and girl students is not significant.

So, the seventh null hypothesis "There is no mean score difference between girls and boys science achievement at the pre-test who belongs to the control group" is failed to reject. As the results displayed in the above table are evident that both boys and girls students equally had an understanding of the concepts of the science subject at the time of pre-test.

H_0 4: There is no mean score difference between girls and boys science achievement in the post-test of the experimental and control group.

Table 7
Comparison of Boys and Girls Students' Science Achievement in Post Test of Control Group

Gender	N	M	SD	t	df	p	D	95% CI	
								Lower	Upper
Boys	7	22.00	6.76	-.561	13	.585	-.29	-7.89	4.64
Girls	8	23.63	4.37						

*p < .05

In the aforementioned table, the results of the independent sample t-test were displayed that was utilized to find out the difference in the scientific achievement of students of the control group in post-test with regards to their gender. These results illustrated that at the time of post-test both boys and girls' students were equally inclined toward science as there is no significant difference in their results. As the mean value of girls students (M = 23.63, SD = 4.37) is not significantly higher than the mean value of boys students (M = 22.00, SD = 6.76). Moreover, t = -.561 and p = .585, considering these results it is concluded that the mean difference at the time of the post-test between boys and girls students is not significant.

So, the sixth null hypothesis "There is no mean score difference between girls and boys science achievement at the post-test who belongs to the control group" is failed to reject. As the results displayed in the above table are evident that both boys and girls students equally had an understanding of the concepts of the science subject at the time of post-test.

Table 8
Comparison of Boys and Girls Students' Science Achievement in Post Test of Experimental Group

Gender	N	M	SD	T	df	p	D	95% CI	
								Lower	Upper
Boys	9	15.11	3.18	-3.04	13	.009	-1.6	-12.07	-2.05
Girls	6	22.17	5.85						

*p < .05

In the aforementioned table, the results of the independent sample t-test were displayed that was utilized to find out the difference in the scientific achievement of students of the experimental group in post-test with regards to their gender. These results illustrated that at the time of the post-test, girls students were more inclined toward science than boys students, as there is a significant difference in their results. As the mean value of girl students (M = 22.17, SD = 5.85) is significantly higher than the mean value of boy students (M = 15.11, SD = 3.18). Moreover, t = -3.04 and p = .009, considering these results it is concluded that the mean difference at the time of the post-test between boy and girl students is significant.

So, the eighth null hypothesis "There is no mean score difference between girls and boys science achievement at the post-test who belongs to the experimental group" is rejected. As the results displayed in the above table are evident that girl students had a better understanding of the concepts of the science subject at the time of the post-test.

Results

1. The results illustrated that at the time of pre-test students of both groups were equally inclined toward science as there is no significant difference in their results.
2. The results illustrated that at the time of post-test that students belonging to the experimental group improved their achievement in science by performing more than the control group students.
3. The results illustrated that at the time of pre-test both boys and girl students equally had an understanding of the science subject.
4. The results illustrated that at the time of the post-test girls showed more understanding after intervention than boys.

The researcher concluded by keeping in mind the above-mentioned findings that the fifth-grade students studied in govt. primary school in district Korangi, Karachi, achieved better scores in

science after learning through activity-based learning as compared to those students who continued their studies through traditional lecture method. Despite the better performance of experimental groups' students in the post-test, the students of the control group also performed significantly well in their post-test. Both boys and girls students of the experimental group equally had an understanding of science at the time of the pre-test and post-test. Contrary to this, girls students of the control group acquired higher scores in science in the post-test, while they performed alike in the pre-test.

Discussion

In order to have effective learning for students there is a need to transform the old style of teaching into an innovative and constructive one. Therefore, the researcher utilized activity-based learning approach to foster the students' learning. Two-way communication between a teacher and his students provides a baseline for activity-based learning. Such learning gives a platform for students to investigate through exploring the facts. Meanwhile, enjoy the whole learning process by experiencing different experiments with their fellows. It promotes the constant engagement of students in learning. Consequently, they started taking part in learning experiences rather than staying a passive learner. This active involvement and collaboration of students in classrooms make it different from traditional modes of teaching (Celik, 2018).

The results of study are used to describe the nature of variables. For instance, in the current study researcher manipulated the independent variable which was a teaching methodology and intended to know the effect of the traditional style of teaching replaced with a constructivist teaching approach on students' achievement especially related to science. The researcher used activity-based learning as a constructivist teaching approach.

Adak (2017) and Gupta (2017) stated that constructive method generates thought process. It helps students in brain storming and stimulates children to engagement in their education. Similarly the results of the present study highlighted that students who belonged to the experimental group improved their achievement in science by performing better than the control group students in the post-test.

Additionally, the results of this research are evident that students who belonged to the experimental group significantly improved their achievement in science by performing better in the post-test. These findings are similar to a previously conducted experimental study by Celik

(2018). He carried out his study to investigate, which teaching methodology is beneficial for better academic results in mathematics, either traditional or activity-based learning. He randomly divided 78 students of sixth grade into two groups. The results of his study reflected the significant improvement in the academic achievement of experimental group students. Similarly, the aforementioned results are also consistent with the finding of Albadi (2019). He also intended to inquire the effect of activity-based learning by deviating from the traditional mode of learning in the classroom on students' achievement. Twenty four boys students, enrolled in 12th grade in one of the public schools of Oman were the sample of the study. The results of study show that activity-based learning is beneficial for students' biology achievement. Similarly the results of current study shows improvement in learning achievement in the subject of general science.

Anwer (2019) also stated that activity based learning has a favorable influence on student's motivation and academic accomplishment at the higher secondary level. It increases learning achievement. Another study by Noureen et al. (2020) shows that constructivist approach teaching method caused better achievement than teaching by traditional methods. The current study support the findings of the previous studies.

Moreover, literature shows that both boys and girls students equally had an understanding of the concepts of science subject at the time of the post-test. These results of the current study are consistent with the findings of Iqbal and Afzal (2022) research too. The results of their study illustrated that students' achievement was improved by utilizing activity-based learning in school; they not only learn in a better way but also perform efficiently through this mode of teaching and learning rather than lecture method. After learning through activity-based learning they become capable to confidently handle issue of their daily life. An improvement in their social skills were also observed, and no discrimination were seen regarding gender in students' achievement, confidence, problem solving, and social skills in result of activity-based learning.

Conclusion and Recommendation

The fifth-grade students who studied in govt. primary school in district Korangi, Karachi, achieved better scores in science subject after learning through activity-based learning as compared to those students who continued their studies through traditional lecture method.

The findings of the current study highlighted the importance of innovating teaching methodology like activity-based learning that significantly proves beneficial in improving the students' science achievements. It also reflected that the activity-based teaching methodology helped the students perform better than the students who taught with traditional methods. In the light of these results researcher gave some recommendations considering the results of the current study. These are as follows:

1. Teachers of primary school may change their traditional mode of teaching to develop students' interest in studies.
2. School administrations might ensure the availability of all required factors for the effective implementation of such innovative teaching methodologies for a better understanding of students.
3. The current research was carried out by manipulating the teaching methodology for delivering science information. Other subjects may consider in the future that may prove beneficial to completely describe the above phenomenon.
4. Similar research studies are suggested with the different samples elementary or secondary level.

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