

**Effectiveness of Peer Tutoring Method in Improving Secondary School Students Chemistry Achievement****Hakim Ali¹, Muhammad Jawad Tahseen*², Muhammad Akram Malik³**¹ Faculty Member, Department of Education, University of Southern Punjab Multan, Pakistan.Email: hakimaliwhisl@gmail.com² PhD Scholar, Department of Education, University of Southern Punjab Multan, Pakistan.Corresponding Author Email: jawad.jawad786@gmail.com³ Professor & Chairperson, Department of Education, University of Southern Punjab Multan, Pakistan.Email: hodeducation@isp.edu.pkDOI: <https://doi.org/10.70670/sra.v4i1.1624>**Abstract**

Peer tutoring is used worldwide as an appropriate and effective tool for improving students' learning at all levels of schooling. In this context, the main intent of this quasi-experimental pretest-posttest control group design study was to analyze the effect of peer tutoring on secondary school students' chemistry achievement. All the 6998 male students enrolled at secondary level in Tehsil Muzaffargarh were taken as population. Two intact/preexisting sections of grade 10th in Govt. High School Khan Pur Bagga Sher Tehsil Muzaffargarh were selected as representative sample. One section with 50 students (Experimental group) was taught using peer tutoring method. The other section with 45 students (Control group) received instructions with conventional method. Researchers collected data using pretest and posttest. Both the descriptive (Mean, SD) as well as inferential statistical techniques (Independent Samples t-test and Paired Samples t-test) were applied to analyze the data. It was found that there was a significant difference between Chemistry achievement of both the groups i.e., experimental group who received instructions with peer tutoring method and control group who received instruction through conventional method. The findings further suggest that the use of peer tutoring method has significantly positive effect on secondary students' chemistry achievement. Finally, this study provides the valuable implications for teachers, school administrators and policy makers to take steps for enhancement of students' academic achievement in the subject of Chemistry at secondary level.

1. Introduction

Peer tutoring has numerous advantages for both the tutor and his/her students. Moreover, human being has natural tendency towards socialization so they learn better with the support of tutors (Balogun, 2025; Carda-Broch et al., 2025; Adamu et al., 2024). Peer tutoring is beneficial in teaching learning process because students learn in friendly and same age pairing groups (Ali et al., 2015; Annis, 2013; Gagne et al., 1993; Vigotsky, 1989). Many students feel comfortable while asking question in the same group and they also participate without any assistance because less power dynamic is needed here in their participation and communication (Alexander, 2024; Chambers, 2025; Miller & Miller, 1995; Comfort, 2011; Comfort & McMahon, 2014; Ekanem et al., 2025; Neubauer et al., 2025). Miller and Miller (1995) further found that the participation of tutor and tutee in peer tutoring process produced maximum positive results. Smith and Nicolai (2013) observed that in peer tutoring process not only tutee increase his knowledge or learning but tutors can

also enhance his teaching as well as educational skills.

Furthermore, it is powerful, productive, time saving, useful and valuable approach for the timely completion of the course content, when teachers are not enough or time is too short (Hida & Saad, 2025). Piaget (1974) supported that adaptation is necessary for the learning of new things (Hidayat & Saad, 2025; Lin et al., 2025; Springer, 1991; Ullah, 2025). According to this view, every children has a previous knowledge which is to be modified into new pattern, new situation and accommodation of new information can be only put in mind with the help of tutor, mentor, counselor and observer also. In this regards, Piaget (1974) presented the peer tutoring as reconstruction of ideas, knowledge, learning process and designing the new form to information (Hidayat & Saad, 2025; Chambers , 2025; Ajayi et al., 2023).

Moreover, it presents the lecturers on aptitude to entertain, furnish and supply a schoolroom of different learners to increase tutorial practice across thinking ability and knowledge, at a time once university resources area unit stretched and demands upon workers area unit increasing, peer learning offers students the chance to be told from one another (Outhred & Chester, 2010; Austin, 2008; Chastain, 1998; Nwafor et al., 2024). It offers students significantly additional apply than ancient teaching and learning strategies in taking responsibility for his or own learning and, additional typically, learning a way to learn (Balogun, 2025; Pearson & Johnson, 1978).The intervention permits students to receive matched help; Peer tutoring is additionally valuable for the tutor, i.e. learning is increased through teaching (Campit et al., 2015; Komócsi et al., 2025; Akudo et al., 2025; Gattis, 2002; Vasay, 2010).

Similarly, confidence level of the tutee can be increased by communication and association with the tutors (Fulk, 2001; Bowman-Perrott, 2009). Likewise, Redzimska and Sulikowski, (2024) also reported that peer produces the way of taking responsibility, taking part in activities and enhancing the socialization among the children of same age. The exchange of information and knowledge become more and more discussing topic among the students and they easily cover their course of study and content knowledge (Alexande, 2024).

However, peer tutoring is involved in educational procedure as a coaching and schooling approach where a group of scholars cooperate or inherit contact with each other to support each other's learning by one student inhabiting the role of tutor and also the other student or group of scholars as an assignment of tutee (Balogun, 2025; Ekeoha & Agommuoh, 2025; Herinek et al, 2024; Kareem & Ewuola, 2025). Moreover, in teaching and learning process individual differences cannot be neglected at any stage. During the tutoring process, activities can be selected to keep in mind the conditions of individual differences. Some important situational based activities can be taken as discussion, group work, tuition work, mentoring, counseling, guidance and peer tutoring (Beevers & Paterson, 2002; Piaget, 1974; Hartman, 2010; Tan & Evera, 2020; Mitchem et al., 2001).

Ugwu et al. (2023) stated that academic benefits of the peer tutoring are healthy participation of students, their problem-solving method, facilitation of others pupils and giving feedback to others students in their work to minimize the anxiety among the students (Topping, 2000; MacDonald, 2000; Pugatch & Wilson, 2018). Tong (2004) also explained that achievement in performance can be increased by this method of teaching, and the overall assessment can be taken out easily. They also concluded that tutors are likely to experienced one and they are helpful to take the assessment process during peer tutoring. The tutors go to explain the ideas, concepts and other content knowledge in detail or deep sense to the tutee during learning time in classroom (Kalu-Uche & Ogbonna, 2021; Sandford et al., 2010; Web et al., 2006).

Peer tutoring may be a versatile, peer-facilitating process that engages students working as educational teachers as students. Generally, better experienced students are paired with a lower experienced student to concentrate on essential educational or activity ideas. Furthermore, it is an efficient procedure for finishing the tasks about course contents where there is a shortage of staff or teachers and teachers having a limited time for teaching to whole classes in multi grade teaching (Gangne et al., 1993; Saunders, 2002).

Gordon (2008) described that the peer tutoring is a tool of creativity developing and promoting intellectual abilities of both students working as tutor and tutee. Grubbs (2009) also pointed out some weak points based

on management and administrative ground of activities related to peer tutoring. So, he concluded that some powerful supervisory back ground is needed during peer tutoring. Moreover, it is also seen that if students having a pair of more trends towards learning, they produce the good results during peer tutoring (Harper & Maheady, 2007; Philip, & Council, 2010; Russ, 2015; Santee & Gravalia, 2006).

Some main definitions of the peer tutoring conjointly given as by Glickman (1991) that it may be a delivery of group of instructions during which learners facilitate one another and increase his learning abilities also after the repeating of lesson many times with peers. Johnson et al. (2014) and Johns and Kolka (2005) explained that the group learning is outlined as pupils of similar thoughts and content knowledge, because they are not professionally skilled persons like teacher, serving with one another to find out and learning themselves by teaching. Lee and Bush, 2003 described “the peer tutoring as it is a child centered cooperative, learning procedure ... which is used to remodel students so that an active and powerful learning activities can be achieved instead of passive, dependent and less engaged activities” (Mehra & Mondal, 2005; Stigmar, 2016; Weimer et al., 2025).

The peer tutoring scenario among same age students and different age students or grouping at any level is considered or assumed to possess a useful effect on sender and receiver level of learning, so that life skills can be developed among tutors and tutees (Beasley, 1997; Boudouris, 2005; Colvin, 2007; Jones & Kolko, 2005; Madrid et al., 2007; Shabani et al., 2010). It is associate educational system during which students teach different students. According to Damon and Phelps (1989), its associate approach that during which one kid instructs another kid in material on which the primary may be a skilled and also the second is a novice.

Gaustad (1993) expressed that it happens once tutor and learner are at a similar age. The tutor may be older than the learner in cross age tutoring that generally this is often wont to embrace each varieties. According to parliamentarian Thomas (1979), it is the method by which a skilled and decent students, after borderline coaching and with teacher’s steerage, guides one or additional pupils at a similar content of knowledge. Peer tutoring is associated with providing of advantages especially in disabilities among the children and to give benefits to both participants (Miller, 2003).

Grubbs (2009) explained that teachers should be aware about the objective of the contents and he should be familiar with the educational, psychological and the emotional behavior of students. It was found that during the peer tutoring process of learning, it provides a simpler or showed larger gains for having different grades of classes, with different sociological back grounds and different areas of school of thoughts (Saito, 2008). Peer tutoring at all grade level learn an easy ability or basic conception. Peer tutoring offers lecturers the aptitude to accommodate a school room of numerous learners to boost educational action for increasing the mental as well as educational power of learning (Cohen et al., 1982; Cook et al., 1985; Johnson et al., 1981).

Nicholas (2021) also reported that children having high literacy rate have a great influence on the achievement of others students in the class room environment. It’s believed that through impersonation, ones conduct and cognizance are impacted. Some problems facing by teachers moreover as educational department may also be overcome by this strategy also like restriction of teachers and infrequent financial assets will be overcome by peer tutoring, i.e., appointment and engagement of volunteers and deep-rooted experienced students. Furthermore, due to its participatory tactic, peer tutoring may additionally help in controlling and regulating the drop-out of the low achiever students to a greater extent (Topping, 2000). Like so on, Peer tutoring has been shown to end in improved transferable skills and better degree assessment outcome (Topping, 2000; Elkhidir, 2020).

Bandura and Schunk, (1981) also describes that the socialization process is being important for students. Thus, combination of impersonation and mutual understanding, peer tutoring produces the educational environment for students to learn at any place (Mesler, 2009). Hartman (2010) also gave importance on the peer tutoring that it should be taken as a supplementary process of teaching and learning, and not a change to teacher to assign the activities in classroom also. However, it produces the more productivity of learning better than the previous situation. The tutee can perform better in new condition than the previous situation (Eze & Dinneya,

2022).

Peer tutoring also favored by the constructivists, both Vygotsky (1987) and Piaget (1974), because they argued that learning does not occur in the reconstruction process instead of change in mind and learning behavior. The Piaget (1974), tutoring doesn't occur completely from the outside situation factors; rather, it's a reframing process of ideas, thoughts, judgments, feelings and emotions within the human mind. Peer tutoring was considered to be benefit in socialization experiences, knowledge, skills, understandings and the degree of interaction, communication, contact and inter linking the concepts among pupils, learners and students both inside and outside the classroom developed fundamentally and basically.

Peer tutoring is not only paying great contribution for useful increasing of academic performance but also enhancing the learners' abilities like learning skills, motivation and socialization in society also (Johnson et al., 2014). Moreover, Vygotsky (1987) also believed as peer tutoring play an utmost significant role in the life development skills of students. The healthy association can be developed among the students during learning through peer tutoring method which is helpful for students to investigate their personal skills and to explore their logical skills (Moreno & Duran, 2002). Oviawe (2008) also resulted that as an interaction among the peer, a new pattern of thinking can be developed among the students.

According to the Rizve (2012), children are performing better in their zone of proximal development by peer tutoring method from the students who are still treated in traditional methods of studies like lecture method etc. Like, Moreno and Duran (2002) viewed that it is a cooperative learning among the students which polishes their mind and generates new concepts of thinking because we believed that the tutor and tutee don't equal academic ability but they share a typical information, goals and tasks to one another. Yusuf (2004) pointed out that these goal must be achieved through a relationship framework organized by the teacher to advance the child cognitive development. Peer tutoring is considered as a powerful source of change of behavior of learners.

Fuchs et al. (2002) argued that peer tutoring participate in the character improvement, upgrading and enhancement of schoolchildren during their socialization, learning class room condition, and interaction. Peer tutoring was discovered to be useful in interaction and association experience because the degree of cooperation among students both inside and outside the study room improved fundamentally. Considering the above mentioned background, there's sufficient proof in literature about the usefulness of peer tutoring at secondary level especially in teaching the various subjects in enhancing the students' performance or learning outcomes in any respect educational level.

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It can, thus, be concluded that together with other school facilities, promoting the culture of peer tutoring is additionally essential for enhancement of students' learning outcome. As mentioned earlier, the past several years has witnessed an ascent of technology and its use in education. An important effort has been made to extend the standard of education. Similarly, usefulness of peer tutoring has not much been studied from the angle of students' performance at secondary level (Vygotsky, 1987). Like so on, Peer tutoring has been shown to end in improved transferable skills and better degree assessment outcome (Topping, 2000; Isma'il, & Matazu, 2024).

2. Research Hypotheses

Following three hypotheses were formulated to test the main objectives of the study.

1. There is no significant difference between the overall mean score of experimental and control group with respect to pretest.
2. There is no significant difference between the mean scores of overall experimental and control group with respect to posttest.
3. There is no significant difference between the overall mean score of experimental group with respect to pretest and posttest.
- 4.

3. Method and Procedure

3.1 Study Design, Population and Sample

This study employed a quasi-experimental pretest-posttest control group design. Cresswell (2012) explained that this design is suitable for analyzing cause and effect relationship between independent and dependent variable. In this design, two intact/preexisting groups are taken as sample based on non-random criteria. This is because the experimenter could not artificially create groups for the experiment and researchers generally use intact groups in quasi-experimental design. All the high schools having enrollment above 30 in secondary classes were considered as the population in this study. But one school i.e., Govt. High School Khan Pur Bagga Sher Tehsil Muzaffargarh was selected as sample for conducting this study. There were 119 students enrolled in class 9th and 95 students in class 10th in the sample school. Researchers selected the class 10th as a sample of study with 50 students in section 'A' (experimental group) and 45 students in section 'B' (control group).

3.2 Tool Development and Validation

The data collection tool used in this study was 10th grade Chemistry test. One of the members of the research team, being a Chemistry teacher at secondary level, personally prepared pre-test and post-test in line with the prerequisites of 10th grade syllabus to measure the students' chemistry achievement. The pre-test was developed consistent with prescribed and standard pattern of Board of Intermediate and Secondary Education (BISE) Dera Ghazi Khan. The pretest was developed from already taught four chapters of recommended Chemistry Text Book keeping in view the students' ability level. Researcher used the same test for pre-test and post-test to make sure the reliability with regard to content, format as well as students' cognitive level. The test contained 60 marks and was divided into three parts as per BISE mark distribution scheme i.e., 12 marks for multiple choice questions (MCQs), 30 marks for short answer questions and 18 marks for essay type/long answered questions. Table 1 indicates the marks distribution of pretest and posttest.

Table 1: *Marks distribution scheme of pretest and posttest*

Total Chapters	MCQs	Short Answer	Long Question	Total Marks
4	12 Marks	30 Marks	18 Marks	60 Marks

For validation of the pretest researchers consulted with three subject experts who were senior chemistry teachers and also working as paper setters as well as examiners with BISE Dera Ghazi Khan for many years. Furthermore, a pilot test was conducted with class 10th students of a nearby school. The participants of the pilot testing were requested to give feedback about the relevance and format of test items, test reliability, time required for test completion and other concerns regarding the test. The pretest was revised and finalized in line with the changes suggested by the panel of experts and participants of the pilot-testing. Reliability of the tool was measured using Cronbach Alpha formula and found to be 0.80 above acceptable range.

3.3 Tool Administration and Data Collection

After completing the requisite permission process from school administration, the pre-test was conducted with sample students to check the academic level of students in already taught syllabus of chemistry. Forty lesson

plans were developed covering the total syllabus of four chapters of 10th class chemistry for both the groups. All the lesson plans were approved by the experts along with school administration. The experimental group was taught through peer tutoring method by the researcher, while the control group received instruction through conventional method. by the already allotted school teacher

The experimental group was divided into two sub groups like tutor and tutee. The proper division of teaching sessions was scheduled to teach them by peer tutoring technique. The study period for experiment was eight week. The proper lesson planning for each week was made and every week consisted of the selection of topics from the text book of subject chemistry for class 10th. The course contents were divided according to time allotted for study and duration of lesson. The main students learning outcomes were made according to text book criteria and scheme of study provided by the board based on the standard pattern.

During the experiment, the tutor students were advised to teach, help and assist their other group's members so that learning as well as teaching was made in friendly and peace full environment. During the session, the overall academic activities were examined like their group discussions, their activities, their participations and completion time of any assigned task during the peer tutoring process. If any group was facing any problem or difficulty in their studies, teacher helped them and appreciated them in their achievement. All the sub groups involved in the experiment were supervised carefully and monitored properly. A proper time was given to them for group discussion and questions answer session.

At the end of every week, a discussion session was also conducted to review the summary or achievements about the lesson. Thus, eight-week schedule was completed properly and contents of subject as well as exercises of the chapters were taught by peer tutoring method. In the last week a revision was made for the preparation of posttest and it was observed that not only tutors but also tutees have a capacity to get through the posttest.

The control group was taught by already allotted school teacher and they delivered their contents by traditional and lecture method as well. There was not any grouping of students like tutors and tutees for learning process. No problem-solving technique was used and teaching was solely limited to the old or traditional methods. After completing the eight week study duration, post-test was taken from the both groups to measure the effectiveness of peer tutoring model after eight weeks.

3.4 Data Analysis and Results

Researchers, in this study, used frequency count, percentage, independent samples t-test and paired samples t-test to analyze the obtained scores from pretest and posttest. The analysis of demographic information of the participants is given in the Table 2.

Table 2 *Demographic information of sample students*

Grade	Subject	Gender	Age	Group	N	% Age
10 th	Chemistry	Male	14-17 Year	Experimental	50	52.6 %
				Control	45	47.4 %
				Total	95	100 %

Table 2 shows that the study was conducted at grade tenth students who were studying the subject chemistry. The age range of the students was 14-17 years; there were 50 students in section 'A' who were labeled as experimental group and 45 students were enrolled in section 'B' was taken as control group as shown in Figure 1.

Figure 1

Demographic information of sample students

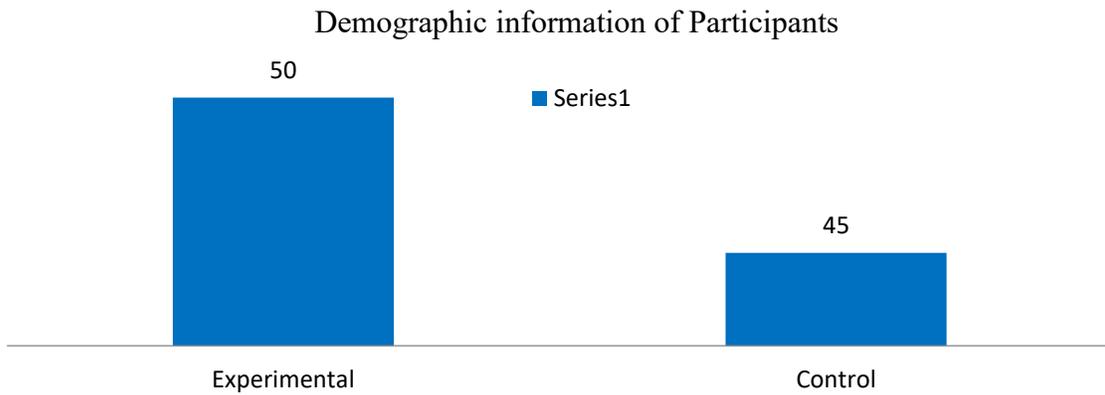


Table 2 and Figure 1 showed that experiment group was 52.6% with 50 students and control group was 47.4 % wit 45 students of the sample of study. 95 students were taken for the sample of study. From Table 2, it was concluded that percentage (52) of the experimental group was slightly higher than the percentage (47.4) control group and the same was depicted in Figure 1.

H₀1: There is no significant difference between the overall mean score of experimental group and control group with respect to pretest.

Table 3: Independent samples t-test for experimental group and control group pretest score

Group	N	Mean	Std. Deviation	t-value	df	Sig
Experiment	50	43.9	7.08	1.85	93	0.98
Control	45	41.2	7.18	1.85	91.6	

Table 3 demonstrates the results of an independent-samples t-test that was applied to compare the overall mean score of experimental group and control group with respect to pretest. The demographic characteristics and mean values of the students also shown in Figure 2.

Figure 2

Independent sample t-test for experimental and control group pretest

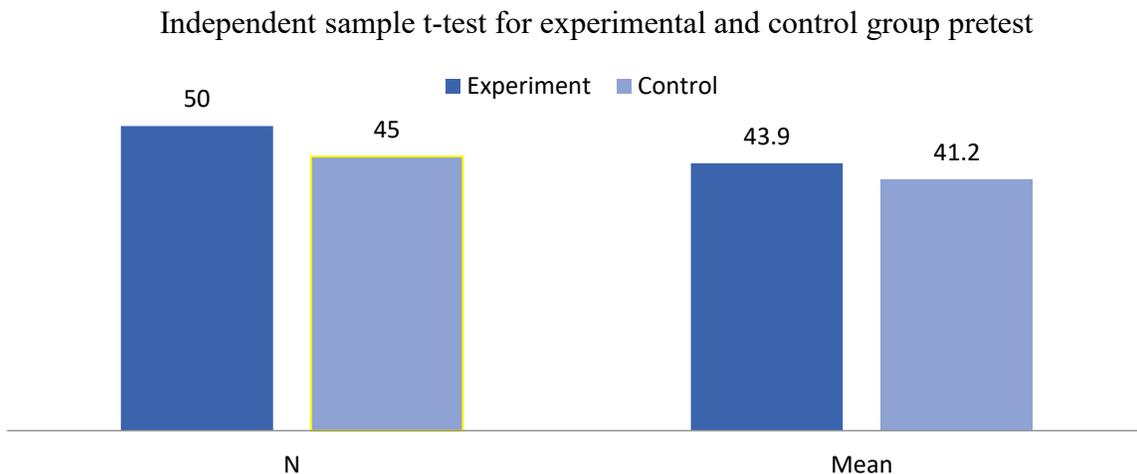


Table 3 and Figure 2 reveal that the p values for overall mean score of experimental and control group with

respect to pretest was found .98. It reveals that the mean of the Experimental group is 43.9 and the Control group is 41.2. Moreover, the mean values indicated that both the groups are normally distributed and seemed almost equal. The values of df (Degree of freedom) indicates that there is difference of 1.4. Moreover, it is concluded from Table 3 that both groups are near to equal in academic performance in Chemistry in pre-test. It was concluded from Table 1 that the value of Sig. was greater i.e.0.98 than the assigned value 0.05 so the null hypotheses was accepted and same data is reflected in Figure 2. Table 3 also showed that there was a difference in the mean score values of both groups in pretest which also indicated that both groups are not same in achievement in chemistry at this stage. The mean value of experiment was found larger than the control group. This suggests that the experimental group was achieving greater marks in pretest as compare to control group.

H₀2: There is no significant difference between the mean scores of overall experimental and control group with respect to posttest.

Table 4

Independent sample t-test for experimental and control group posttest

Group	N	Mean	Std. Deviation	t-value	df	Sig
Experiment	50	50.82	3.96	3.82	93	0.00
Control	45	45.91	8.05	3.70	62.62	

Table 4 displays results of an independent-samples t-test that was applied to compare the overall mean score of experimental and control group with respect to posttest. The value of N and mean values are also displayed in Figure 3.

Figure 3

Independent sample t-test for experimental and control group posttest

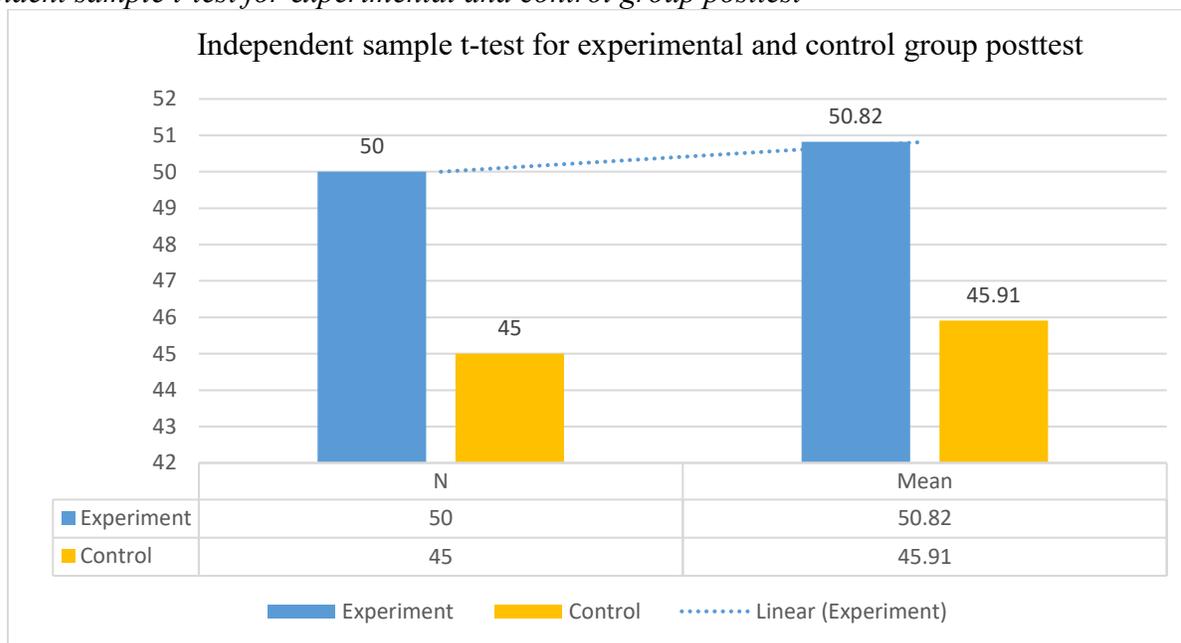


Table 4 and Figure 3 also reveal that the p values for overall mean score of experimental and control group with respect to pretest were greater than .005 i.e. .00. It indicates that the mean of the Experimental group is 50.82 and the Control group is 45.91 having the difference 4.91. The values of df (Degree of freedom)

indicates that there is difference of 30.38. Table 4 interpreted that the both groups are not equal in academic performance in Chemistry at the end of experiment or after the treatment through peer tutoring method and there is a significance difference in academic achievement at that time. Table 3 has a conclusion that the value of significance level is less than 0.05.

From Table 4, it can, thus, be inferred that there is a rejection of null hypothesis and a significant difference is seen in overall performance of experimental and control groups in posttest achievement and also described in Figure 3. The difference in achievement was found greater in experimental group as compared to pretest value because in this analysis the mean value was 50.82 which were greater than the pretest value as shown in Table 3. Similarly, it was also found that the value of mean (N=45.91) for control group was also found large in posttest as compared to pretest value of control group as shown in Table 3.

H₀₃: There is no significant difference between the overall mean score of experimental group with respect to pretest and posttest.

Table 5 Paired sample t-test for experimental group with respect to pretest and posttest

Group	N	Mean	Std. Deviation	t-value	df	Sig
Pretest	50	43.92	7.08	6.3	49	0.00
Posttest	50	50.82	3.96			

Table 5 indicates that a paired-samples t-test was conducted to compare the significant difference between then overall mean score of experimental group with respect to pretest and posttest. The value of N and mean values are also shown in Figure 4.

Figure 4: Paired sample t-test for experimental group with respect to pretest and posttest

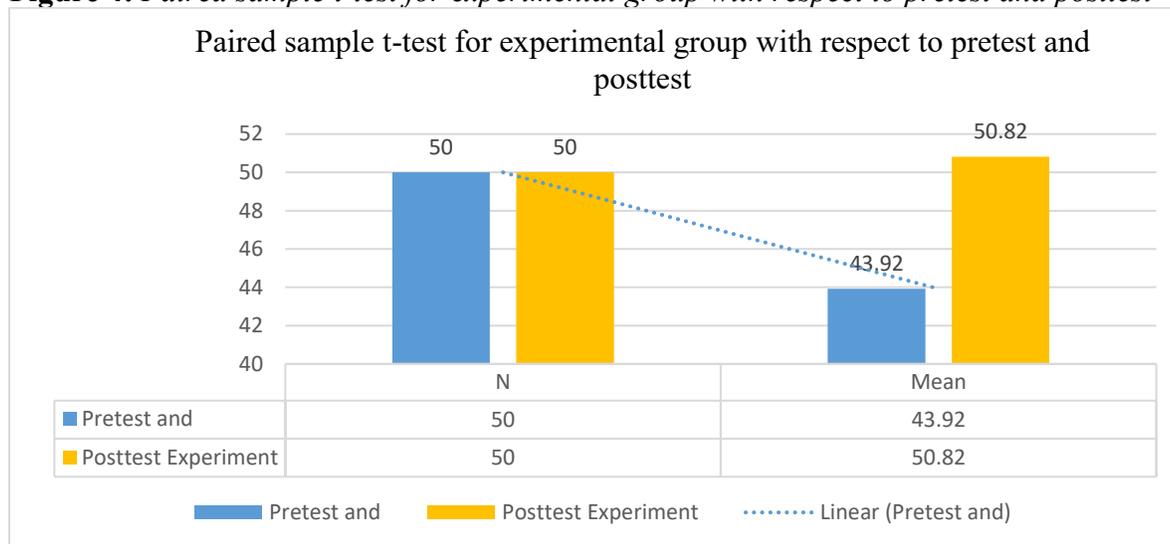


Table 5 and Figure 4 showed that there was a significant difference in the scores for pretest experiment group (M=43.92, SD=7.08) and post experiment group (M=50.82, SD=3.96) and the standardized value of p is 0.005 (p=0.005). These results recommend that there is an increase in the academic performance of students in Chemistry. Specifically, our results advocate that when treatment like peer tutoring is given to the experimental group, there is utmost increase in their performance. Moreover, from Table 5, can also conclude that the value of p is 0.00 which is less than the assigned value i.e. 0.005, so the hypothesis is rejected because the value of p (0.00) illustrates that there is a significance difference in these two groups with respect to their

academic achievement as shown in Figure 4.

4. Discussion

The main objective of this quasi-experimental pretest-posttest control group design study was to analyze the effect of peer tutoring on students' academic performance in chemistry at secondary level. This study found that the use of peer tutoring method has significantly positive effect on secondary students' chemistry achievement. These findings were aligned well with the conclusions drawn in a number of previous studies (Abdul Raheem, 2017; Ain et al., 2023; Eze & Dinneya, 2022; Fakiye, 2021; Ugwu et al., 2021).

Previous findings also revealed that secondary school students taught Chemistry using peer tutoring tend to achieve higher mean scores compared to those taught through traditional lecture methods. For instance, Ugwu et al. (2021) found that peer tutoring significantly improved students' understanding and retention of complex Chemistry topics compared to the lecture method. This finding is supported by Ain et al. (2023), who reported similar results in a study conducted across several countries, indicating that peer tutoring fosters greater engagement and allows students to clarify concepts through collaboration, reinforcing their knowledge and critical thinking skills leading to better academic outcomes. Likewise, study findings of Eze and Dinneya (2022) also demonstrated that peer tutoring led to higher mean achievement scores, as students were more active in their learning process and able to ask questions freely, which is often not the case in the passive lecture environment. Similarly, Fakiye (2021) found that secondary school students who participated in peer tutoring sessions outperformed their peers who received teacher-centered instruction in Chemistry, largely due to the interactive nature of the tutoring sessions.

Some studies (Ihekwoaba et al. 2020; Ratanarajah et al., 2020), however, presented conflicting evidence. Ratanarajah et al. (2020) argued that peer tutoring may not always result in better performance, particularly when tutors lack sufficient subject knowledge. In such cases, the lecture method, delivered by an expert teacher, provided clearer and more structured explanations, leading to better outcomes. Thus, while the majority of studies, support the effectiveness of peer tutoring in improving Chemistry achievement, some caution that its effectiveness depends on the tutors' competence and the nature of the material being taught. Ihekwoaba et al., (2020) focused on gender-based differences and found that male students tended to benefit more from peer tutoring than female students, citing social dynamics and participation levels as contributing factors.

While peer tutoring offers significant benefits, certain challenges may limit its effectiveness if not properly managed (Balogund, 2025). A primary concern is the risk of misinformation since peer tutors, who are also learners, might unintentionally share incorrect information, potentially leading to misconceptions. Thus, teachers' vital role as quality controller and facilitator is critical in peer tutoring method (Balogund, 2025). Through active supervision and timely feedback, teachers can help ensure that students are sharing accurate information. Time management is another concern, as peer tutoring often requires more time than traditional methods (Balogund, 2025), particularly in large classrooms with limited one-on-one attention. To address these concerns, this study suggest that teachers should set clear goals, allocate specific time slots and define roles within each session, making sessions more focused and efficient.

5. Conclusion and Recommendations

Statistical data analysis concluded that the academic achievement rate of both the groups (i.e., experimental and control) was not equal and there was a significant difference in their achievement level. The analysis of pretest scores of experimental group in comparison with control group showed that there was not a significant difference in sample students' chemistry achievement. The posttest scores of the experimental group provided the evidence that the academic achievement of the students in chemistry subject increased positively. Learning

through peer tutoring showed the better results in final posttest than the traditional method used to teach control group.

This study recommends that higher authorities and educational administrators should pay a special attention on the peer tutoring during the preparation of lesson planning. The educational institutions that are responsible for the CPD (Continuous Professional Development) training courses for the improvement of pedagogy of teaching staff should make ensure that the peer tutoring strategy be included in their training manual. For the improvement of generic skills of students, the teacher should deliver a positive discussion and play a key model role before the class that expose the peer tutoring strategy as a supplementary and supporting method of teaching or delivering the content to the class. The educational seminars, workshop, conferences and feedback sessions should be arranged to promote the peer tutoring strategy for teaching in the classroom for the betterment of results.

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