

Article

# Effects of Peer Tutoring on the Academic Achievement of Students in the Subject of Biology at Secondary Level

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**Abstract:** The present study is aimed at analyzing the effects of peer tutoring on the academic achievement of students in the subject of biology at secondary level. The objectives of the study were: (1) To find out the effects of peer tutoring on the academic achievement of students in the subject of biology; and (2) To examine the effects of peer tutoring with respect to knowledge, comprehension and application levels in cognitive domain of Bloom Taxonomy. All 433,405 male students at secondary level of 10th grade of Khyber Pakhtunkhwa were the population of the study. Forty students were taken as the sample of the study from the Allied National Software Institute (ANSI) Mardan. The Posttest-Only Equivalent Group Design was used. The data collected from pretest and posttest were analyzed through an independent sample *t*-test. It was found that the mean score of the experimental group was significantly better than that of the control group. It was concluded that peer tutoring enhanced the academic achievement of students in the experimental group significantly as compared to the control group; hence, it was an effective method of instruction for teaching biology at secondary level. It was suggested that peer tutoring may be incorporated along with other teaching methodologies for the subject of biology and it may be given due consideration in all teacher education practices in the country.

**Keywords:** peer tutoring; tutors; tutees; lecture demonstration method; bloom taxonomy

## 1. Introduction

Individual difference cannot be neglected at any stage of human learning. Therefore, teachers should design learning activities that can better address the individual needs of students. Some need-based learning activities are discussion, group work, private tuition, mentoring and peer tutoring. These methods are usually adopted to enhance students' learning [1] (p. 64).

Tutoring is a process in which expert and trained people help and support other people who are less skilled and have low level of knowledge (or expertise), in an interactive, meaningful and organized way. Usually shy children learn effectively through tutoring by sharing their thoughts with classmates [2] (p. 345). The history of tutoring has undergone an evolution which can be traced back to Roman and Greek ages [3] (pp. 6, 7). As far as peer tutoring is concerned, it is a teaching strategy where a group of students interact to help each other's learning by one student occupying the role of tutor and the other the role of tutee. Usually peer tutoring involves the linking of intelligent students with less-intelligent ones [4] (p. 1). Peer interaction among children is useful in learning new skills, knowledge and solutions to each other's problems by playing, talking, quarreling and sharing ideas [5].

Peer tutoring helps to develop the skills of students to manage and plan learning experiences, work in association, give and receive responses about their activities and finally evaluate their own learning. At present, the significance of peer tutoring is increasing, and it has become an important part of many courses and disciplines in different countries [1] (pp. 62, 64).

According to researchers such as Austin [6] and Eisenkopf [7], peer tutoring has positive impacts on student learning, motivation and socialization. Peer tutoring was found effective in the development of creativity and problem-solving skills of both tutors and tutees. Due to its interactive nature, peer tutoring helps the tutor in understanding the mental level of the tutees and concept about the topic. Results are very successful if the tutor and tutees are engaged in collaborative work and meaningful activities under planned and structured program [8] (pp. 440, 442). Moreover, peer tutoring is advantageous for students, as it provides opportunities for discussion which lead to learning in an affable environment. In the same way, peer tutoring builds up confidence and enhances cognitive levels of introvert students because it gives confidence to shy students [2] which may enable them to express themselves in front of the class [9] (p. 59) or other gatherings.

Likewise, peer tutoring is useful for institutions which offers inclusive education to diversified students [10], because it may reduce the social and behavioral problems among students to a significant degree [11]. In this regard, significant improvement was recorded in the ability of acceptance of responsibility and sense of control of tutors as shown in a study by [12,13]. Similarly, the problem of limited teachers and scarce financial resources can be overcome by peer tutoring, i.e., hiring volunteers and old students. In addition, because of its participatory approach, peer tutoring may also help in controlling drop-out rate of weak students to a greater extent [14,15].

However, peer tutoring programs are not free from hitches due to individual differences of students. There are some limitations, which are mostly related to the behavior of the students during classroom activities or management of academic activities during peer tutoring programmes [16,17]. Therefore, it is necessary that peer tutoring programs should be highly structured and planned and should be conducted under strict supervision and in a controlled environment [18,19].

According to Jo and Almarzouqi [20] (pp. 13–22), a peer in the form of tutor may not always ensure good scaffolding and the reasons for this are the lack of skills and experience of tutors, usually in a situation when the tutors are young. Therefore Lee, Leung and Bush [21] admit that students as tutors should be given proper orientation about the tutoring activity.

The researchers in the field of education are trying to enhance the learning outcomes of the students by introducing innovative approaches. The learning outcomes are of diverse nature; therefore, Bloom [22], Harrow [23] and Krathwohl [24] have categorized the learning achievements into three major categories—cognitive, psychomotor and affective domains—and this classification is named the Bloom Taxonomy [22]. Bloom further classified the cognitive learning outcomes into six sub-levels. Researchers working on learning usually characterize the outcomes of his/her research into these levels of cognitive domain.

As far as the origin of peer tutoring is concerned, it has strong roots both in behaviorist and constructivist approaches of learning [25]. According to the behaviorist approach to learning, the outcome of peer tutoring can be improved by rewarding the tutors for their good performance or providing other favorable conditions for tutoring. Here, the outcomes of peer tutoring are conditioned to some external stimuli, which are the main idea of Skinner's learning theory [26].

In the same way, the constructivists—both Vygotsky [27] and Piaget [28]—were in favor of peer tutoring. According to Piaget, learning does not occur totally from the external influence; rather, it is a reconstruction process in the human mind. Every individual has their own innate abilities and concepts. The information from the external world interacts and integrates with these innate abilities and results in the creation of new knowledge [28]. Piaget's cognitive theory admits that cognition of both tutors and tutees develop in all stages of peer tutoring, e.g., when the tutor prepares the lesson for tutoring session. During this preparation his/her cognition are improving by studying the relevant material. Similarly, during peer tutoring session, when both tutor and tutee are interacting

and exchanging their views, the process of accommodation is taking place and the process of learning is proceeding further. The final stage equilibrium takes place when both tutor and tutee have satisfied each other by communicating knowledge at the targeted level [29]. Similarly, other characteristics of both tutors and tutees, such as discussion abilities, confidence and motivation, also develop through peer tutoring [30].

Vygotsky was the strongest supporter of peer tutoring. Vygotsky said that academic performance of slow learners could be improved if they were engaged in collaborative work or in peer tutoring. Vygotsky classified learners into three categories based on their cognitive development: (1) The zone of actual development, in which the students are independent in their learning, meaning that the individual does not need any help in the learning of a specific topic at this stage; (2) the zone of proximal development, in which the students depends on one other for learning and need a little help (Vygotsky recommended peer tutoring for the students in this stage); (3) the zone of no development, in which students cannot perform or learn something even in the presence of external help, where even peer tutoring is also useless [27]. According to Rizve [31] (p. 171), students experiencing peer tutoring did better in their zone of proximal development than students experiencing traditional methods of teaching in the learning of English.

Several studies carried out on the impact of peer tutoring reveal that it has a positive role in the instructional process. For example, during an evaluation study by Brost [32] (p. 7) in Chippewa Valley Technical College in Eau Claire, Wisconsin, USA researchers explored some facts about peer tutoring. The primary purpose of the research was to evaluate the effectiveness, shortcomings, and practicability of the peer tutoring program that already existed in Chippewa Valley Technical College. The findings of the research showed that the peer tutoring program at Chippewa Valley Technical College was effective but needed some improvement. The process of peer tutoring should be restructured based on prior planning and scheduled so that it improves the level of understanding. The achievement rate of the tutoring program was good but needed further efforts to increase. The door is open for other researchers from all over the world to contribute by devising more tutoring models. In another experimental study conducted by Campit, Cayabyab and Galas [33], peer tutoring was found to have significant positive effects on the performance of students. Similarly, Rizve [31] (pp. 169, 170) measured the effect of peer tutoring on students' academic achievements at secondary level in the subject of English in light of Vygotsky's theory in her doctorate dissertation. She believed that effective learning takes place in the zone of proximal development of a child if help is provided by peers or by some elders. Vygotsky recommended that social interactions, communication and guidance are prerequisites for learning. Therefore, scaffolding was recommended for those students, who are in the zone of proximal development. The researcher provided scaffolding in the form of peer tutoring to the students of the experimental group of 9th grade by the students of 10th grade of the same school in the subject of English. The control group was given instruction through the traditional method. The findings of the study pointed out that the experimental group had performed well as compared to the control group. Likewise, a study performed by Ezenwosu and Nworgu [34] (pp. 944–950) explored the effectiveness of peer tutoring and gender on the achievements of students in the subject of biology. The finding of the study revealed that students who were instructed through peer tutoring had performed significantly better than students of the control group. The results also showed that the scores of male students were better than female students.

Based on the aforementioned studies, it may be said that peer tutoring may be very effective in assisting teachers to increase time for teaching learning activities which is now a serious concern for them. According to the Educational Management Information System [35], in most Pakistani educational institutions the teacher-student ratio is above 1:40. This ratio limits teachers' ability to teach according to the individual needs of students. In this scenario, peer tutoring may be an ideal strategy to overcome the burden of teachers and thus enable them to fulfill the needs of students without any extra financial resources. Some researcher such as Galaviz [36] (pp. 44, 45) and Smith and Nicolai [37] showed that due to a lack of proper planning and administration, peer tutoring sometimes

has negative effects on students. Therefore, it was necessary to conduct peer tutoring in a controlled and planned manner.

### 1.1. Statement of the Problem

Taking into consideration the above discussion about the usefulness of peer tutoring during the learning process, the purpose of the study was to investigate the effects of peer tutoring on the academic achievement of students in the subject of biology at secondary level.

### 1.2. Objectives of the Study

The objectives of the study were:

- (1) To find out the effect of peer tutoring on the academic achievement of students in the subject of biology.
- (2) To examine the effect of peer tutoring with respect to knowledge, comprehension and application levels of cognitive domain of the Bloom taxonomy.

### 1.3. Hypothesis of the Study

The above objectives were tested by the following hypotheses;

- (1) There is no significant variation between the mean scores of the experimental and control groups.
- (2) There is no significant variation between the mean scores of the experimental and control groups with respect to knowledge level of cognitive domain.
- (3) There is no significant difference between the mean scores of experimental and control groups with respect to comprehension level of cognitive domain.
- (4) There is no significant difference between the mean scores of experimental and control groups with respect to application level of cognitive domain.

## 2. Method and Procedure

The following procedure was adopted for the study:

### 2.1. Population

All 433,405 male students at secondary level of 10th grade of Khyber Pakhtunkhwa were the population of study [35].

### 2.2. Sample

Allied National Software Institute (ANSI) school, Mardan was selected for the study. There were 110 secondary students enrolled in four section of ANSI school. The school administration allowed the researcher to conduct the study in only two sections to avoid major disturbances. These two sections were selected randomly among four sections. There were 47 students in two sections, 10th Green and 10th Yellow. The researcher then administered the pretest among the 47 students. Among these, seven students refused to participate in the study for unknown reasons. Therefore, the sample of the study consisted of forty students. The sample was further divided into two equivalent groups (experimental and control groups) based on pretest scores by using pair random sampling techniques. Both groups were further categorized into low-achiever and high-achiever students based on pretest scores. In the experimental group the high achievers were named as tutors and low achievers were named as tutees.

### 2.3. Design of the Study

This study was experimental in nature. Pretest was used to find out the academic level of the students. After taking pretest data from the sample students, the scores obtained were arranged in horizontal order and then divided into two equivalent groups by using the pair random technique.

The mean scores of both the groups before the treatment were almost same. Further results of the *t*-test as given in Table 1 declared the matching of both the groups before the treatment. Therefore, the Posttest-Only Equivalent Groups Design [38], sometimes named Randomized Subjects, Posttest-Only Control Group Design [39] was used for measuring the effectiveness of peer tutoring. Symbolically the design is expressed as:

**Table 1.** The Posttest-Only Equivalent Group Design.

Groups		Independent Variable	Posttest
R	E	T	O <sub>1</sub>
R	C		O <sub>2</sub>

Where R = Randomly Selected; E = Experimental Group; C = Control Group; O<sub>1</sub> & O<sub>2</sub> = Posttests.

#### 2.4. Research Instruments

Data were collected through teacher-conducted pretest and posttest. Each pretest and posttest consisted of 32 items having fifty marks. Before administering, both instruments were pilot-tested. Both tests were prepared based on the first three levels of cognitive domain in line with objectives of the lesson plans and study objectives. The table of specification is given below in Table 2. The reliabilities of the tests were determined by using the split-half method. The scores of both halves were correlated using the Spearman-Brown Prophecy formula and the reliability co-efficient was calculated on 0.92, which showed that the reliability level of the pretest was satisfactory. Similarly, the reliability of the posttest was calculated and was found to be 0.70, which was also satisfactory.

**Table 2.** Table of specification of Posttest.

Levels of Cognitive Domain	Distribution of Items of Posttest				Total (A + B + C + D)	Marks (A + B + 3C + 5D)	%Age
	MCQsA	True/FalseB	Short QC	Long QD			
Knowledge	9	4	3	1	17	27	54%
Comprehension	6	6	-	-	12	12	24%
Application	0	-	2	1	3	11	22%
Total	15	10	5	2	32	50	100%

#### 2.5. Procedure of the Study

This study was experimental in nature and conducted in the ANSI Mardan from 5th September to 22th October of 2016. Before the experiment, pretest was conducted in already-taught areas of biology from the sampled students and the data obtained were interpreted. Based on pretest score, two equivalent groups i.e., experimental and control, were formed through pair random technique. According to inferential statistics (*t*-test), there was no significant difference between the two groups. Each group consisted of high achievers and low achievers. In the experimental group the high achievers were considered to be tutors and low achievers were tutees. After the selection of tutors, a training session of two hours was arranged in which a comprehensive orientation was given regarding their role in the tutoring sessions. The lesson plan of each day was used to be discussed with/instructed to tutors by the teacher, who was assigned to instruct the control group one day earlier.

The study needed two teachers of equal qualification, but the school administration had allotted only one teacher. Anyhow, he was allotted to the control group and the researcher personally monitored the experimental group. The control group was taught through conventional lecture demonstration method and the experimental group was taught through peer tutoring. The same content was taught to both groups at the same time in different rooms. The experimental group was engaged in supervised peer tutoring and the control group was taught through lecture demonstration method. A lesson plan was developed for each session of peer tutoring. Lesson plans were developed by the researcher, because the researcher was a biological sciences graduate and had significant knowledge in pedagogy.

Furthermore, all lesson plans were discussed with subject experts and were approved by the Advanced Study Committee of the University. In total, thirty lesson plans were prepared for the treatment period, at five plans per week. The lesson plans for peer tutoring were designed in such a way as to ensure maximum discussions, questions and answers to enhance participation from both tutors and tutees. Tutors were also guided in how to teach various components of the plan and satisfy their tutees. During the peer tutoring session, the researcher continuously visited each pair and observed the progress and intervened and provided help to the pairs experiencing academic or management problems. The researcher also motivated tutees by asking questions and discouraged passive listening on the part of tutees. Strict rules and discipline were highly needed and were maintained by the researcher and laboratory attendant. When the instructional treatment of seven weeks was over, an achievement test was administered to the students of both experimental and control groups (as posttest) for measuring the effectiveness of peer tutoring.

### 2.6. Data Collection

The pretest was administered to the sample of the study to form two equivalent groups. During treatment period, the experimental group was engaged in peer tutoring and the control group was taught through lecture demonstration method, and the treatment continued for seven weeks. Soon after the treatment was over, the posttest was administered for measuring the effectiveness of treatment.

### 2.7. Analysis of Data

The data collected from the pretest and posttest were analyzed through independent sample *t*-test. The *p* value for testing the hypotheses of the study was 0.05.

## 3. Data Analysis and Interpretation

The data obtained from the pretest and posttest were analyzed and interpreted by using the independent sample *t*-test. The tabulated data are organized and interpreted below:

### 3.1. Interpretation of Pretest Score

**Hypothesis 1 (H1).** *There is no significant difference between the mean scores of the experimental and control groups.*

The values of mean and standard deviation show in Table 3 that the both the groups were normally distributed and seemed almost equal, and the calculated *t*-value (less than table value) supports the null hypothesis. On the basis of this evidence it was interpreted that the difference between the two groups was not significant and both the experimental and control groups were equivalent before the treatment. The normality of the data was calculated through online Anderson-Darling Normality Test Calculator [40], and the values 50.4% for experimental and 43.51% for control group show that both experimental and control groups were normally distributed prior to treatment.

**Table 3.** Significant difference between the mean of pretest scores of control group and experimental group.

Groups	N	Mean	SD	SE <sub>D</sub>	<i>t</i> -Value
Experimental	20	26.5	7.33		
Control	20	25.8	7.1	2.28	0.30

df = 38; table value at 0.05 = 2.042.



### 3.2. Interpretation of Posttest Score

**Hypothesis 1 (H1).** *There is no significant difference between the mean scores of the experimental and control groups.*

Table 4 shows that the calculated  $t$ -value was greater than the table value, which leads to the rejection of the null hypothesis. On the basis of this evidence it was interpreted that the treatment had significant effect on the academic achievement of the students of the experimental group. The values of standard deviation show that the experimental group was not only better in academic achievement but also showed less variation compared to the control group. Further, the normality of the data was calculated through online Anderson-Darling Normality Test Calculator, and the value 48.69% for experimental and 74.59% for control group show that both the experimental and control groups were normally distributed.

**Table 4.** Significant difference between the mean of posttest score of experimental and control group.

GROUPS	N	Mean	SD	SE <sub>D</sub>	$t$ -Value
Experimental	20	36.05	5.4		
Control	20	27.25	7.66	2.095	4.21

df = 38; table value at 0.05 = 2.042.

**Hypothesis 2 (H2).** *There is no significant difference between the mean scores of experimental and control groups with respect to knowledge level of cognitive domain.*

The greater calculated  $t$ -value see Table 5 leads to the rejection of null hypothesis. Based on this evidence it may be interpreted that the treatment had a significant effect on the academic achievement with respect to knowledge level of cognitive domain of the students of the experimental group. The values of standard deviation show that the experimental group was not only better in academic achievement with respect to knowledge level of cognitive domain but also showed less variation as compared to the control group.

**Table 5.** Significant difference between the mean of posttest scores of experimental and control group with respect to knowledge level of cognitive domain.

GROUPS	N	Mean	SD	SE <sub>D</sub>	$t$ -Value
Experimental	20	20.6	2.94		
Control	20	15.5	5.20	1.33	3.83

df = 38; table value at 0.05 = 2.042.

**Hypothesis 3 (H3).** *There is no significant difference between the mean scores of the experimental and control groups with respect to comprehension level of cognitive domain.*

The greater calculated  $t$ -value leads to the rejection of null hypothesis again (See Table 6). Based on this evidence it may be interpreted that the treatment had a significant effect on academic achievement with respect to comprehension level of cognitive domain of the students in the experimental group. The values of standard deviation show that the experimental group was both better in academic achievement with respect to comprehension level of cognitive domain as well as less varied as compared to control group.

**Table 6.** Significant difference between the mean of posttest score of experimental and control group with respect to comprehension level of cognitive domain.

GROUPS	N	Mean	SD	SE <sub>D</sub>	t-Value
Experimental	20	9	1.41	0.66	2.87
Control	20	7.65	1.56		

df = 38; table value at 0.05 = 2.042.

**Hypothesis 4 (H4).** *There is no significant difference between the mean scores of the experimental and control groups with respect to application level of cognitive domain.*

Here again(See Table 7), the greater calculated *t*-value rejects the null hypothesis. Hence, it is interpreted that the treatment had a significant effect on academic achievement with respect to application level of cognitive domain of the students inthe experimental group. The values of standard deviation show the improved performance of the experimental group with respect to application level of cognitive domain and it also showed less variation.

**Table 7.** Significant difference between the mean of posttest score of experimental and control group with respect to application level of cognitive domain.

GROUPS	N	Mean	SD	SE <sub>D</sub>	t-Value
Experimental	20	6.45	2.92	1.23	2.58
Control	20	4.2	2.60		

df = 38; table value at 0.05 = 2.042.

#### 4. Discussion

The purpose of the study was to investigate the effects of peer tutoring on the academic achievement of students in the subject of biology at secondary level. The study was experimental in nature. The study followed pretest posttest equivalent group design. Before the treatment, a pretest was conducted in already-taught areas of biology. Based on pretest scores the sampled students were divided into two equivalent groups through pair random technique. Statistical analysis of pretest scores led to the formation of both experimental and control groups. The experimental group was engaged in peer tutoring for a period of seven weeks while the control group was taught through traditional lecture demonstration method using the same contents for both the groups. The experimental group was observed and monitored by the researcher. After the treatment phase, the posttest was administered to both the groups. The data obtained were analyzed using statistical and narrative explanation. The results are discussed as follows:

H1: Based on posttest score the *t*-value was  $4.21 > 2.042$  (table value) at 0.05 level of significance. This evidence rejects the null hypothesis, while *t*-value shows that there was a significant difference between the mean scores of experimental and control groups. Thus, the mean score (36.05) of the experimental group was significantly greater than the mean score (27.25) of the control group. The results of the study support the findings explored by [32] (p. 40) that peer tutoring may enhance students' grades; however, the study recommended additional research for further confirmation. Similarly, the results also confirm the findings of Rizve [31] (pp. 196, 170) that peer tutoring may enhance the learning of students who are in the zone of proximal development. The results also supported the claims of studies such as [34,41] that peer tutoring has significant effects on academic performance in the subject of biology. One of the reasons for improvement in academic performance may be learning from peers, which further supports Skinner's idea of learning [26]. Likewise, the cause of improvement in academic achievement may be linked to interaction during tutoring and pre-preparatory sessions for peer tutoring, which was Piaget's main learning idea during peer tutoring [28].



The pretest scores revealed that the tutees were low performers i.e., they were in the zone of proximal development; however, they showed enhanced performance in the posttest which might be the result of peer tutoring. This confirms Vygotsky [27]. The results are in the line with the study findings reported by [42].

H2: The mean (20.6) of the experimental group was higher than that of the control group (15.5) on the posttest. The difference between  $t$ -value  $3.83 > 2.04$  and table value at 0.05 level was significant. Based on this evidence the null hypothesis is rejected, and it may be interpreted that the treatment had a significant effect on academic achievement of the students of the experimental group with respect to knowledge level of the cognitive domain. The findings are in the line with the results reported by [43] (pp. 51, 52) that peer tutoring is an effective strategy for improvig academic learning at knowledge level of cognitive domain. This further confirms the claim of constructivist school of thought that children can easily learn something through interactions and discussions [27,30]. In addition, learning from tutors or teaching to tutees may be an agent for motivation of learning for students; this idea may be traced back to behaviorist school of thought as expressed by [26].

H3: The posttest's higher mean (9) in the experimental group and the significant difference between  $t$ -value  $2.87 > 2.04$  and table value at 0.05 (level of significance), rejects the null hypothesis. On these grounds, it may be interpreted that the treatment had a significant effect on the academic achievement of the experimental group with respect to comprehension level of cognitive domain of the students. The findings are in the line with the study results reported by [43] (pp. 51, 52) that peer tutoring is an effective strategy for improving academic learning at comprehension level of cognitive domain. Smilarly, the findings are also supported by [44] that peer tutoring may develop comprehension skills of both the tutors and the tutees in the subject of physiology and anatomy.

H4: The mean score (6.65) in the experimental group was higher than the mean score in the control group (4.2) on posttest. The greater  $t$ -value  $2.58 > 2.04$  (table value) at 0.05 (level of significance) determines that the difference is significant. Therefore, based on this evidence the null hypothesis is rejected, and it may therefore be interpreted that peer tutoring had a significant effect on the academic achievement of the experimental group with respect to application level of cognitive domain.

## 5. Conclusions

Based on the findings represented through statistical analysis of data, the following conclusions were drawn:

1. The performance rate of both the experimental and control group was found to be equivalent on pretest because of no significant difference in their score.
2. The posttest scores provide evidence that the participants of the experimental group seemed to have performed better than the students of control group, which may be an indication of the effectiveness of peer tutoring in biology in contrast to traditional lecture demonstration methods at secondary level.
3. Learning through peer tutoring also advocates constructivists' and behaviorists' idea of learning.
4. The posttest scores show that the participants in the experimental group performed better than the students in the control group with respect to knowledge, comprehension and application levels of cognitive domain. This is also evidence that peer tutoring in biology may be somewhat effective in contrast to traditional lecture demonstration method at secondary level, in the first three levels of cognitive domain of the Bloom taxonomy.

## 6. Recommendations

Based on results and conclusions of the study the following recommendations were made:

- o Since peer tutoring was found to be more effective than traditional instruction in the subject of biology, if resources allow and if it is feasible, the techniques may be incorporated in teaching other subjects as well.

- o Peer tutoring needs a highly structured supervised environment and may be conducted in controlled conditions. Therefore, the principles, procedures and rules of peer tutoring should be given due consideration while preparing and training the prospective teachers.
- o Peer tutoring was conducted as an instructional strategy and was found productive, but it may be more fruitful and prolific if it is used as a supplementary and supporting instructional technique rather than the principal strategy.
- o To enhance their academic achievement, it might be a useful practice if low achievers are allotted to students with high achievement rate so that they are provided with guidance and support in low-performing subjects. Furthermore, to enhance their motivation, the tutors may be rewarded if their subjects show good performance.
- o The current study is conducted on male students of secondary level only; therefore, future research studies are recommended involving both male and female students of different academic levels so that the problem under observations explored in depth.

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