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**Effect of PQ4R Study Strategy in Scholastic
Achievement of Secondary School
Students in Punjab (Pakistan)**

Mrs. Ruqia Bibi, Ph.D. and Manzoor H. Arif, Ph.D.

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Abstract

This experimental study was carried out to investigate the effect of PQ4R study strategy on scholastic achievement of secondary school students in the subject of Pakistan Studies. It was a pretest posttest control group design which involved the independent variable of PQ4R study strategy and the dependent variable of scholastic achievement of students. A sample of 104 girl students was randomly selected out of 390 girl students studying in the school selected randomly from 121 Govt. Girls High schools located in District Rawalpindi (Pakistan). The content validity of pretest and posttest was ensured through designing table of specification and the reliability of pretest and posttest was determined through the use of test retest method.

The sample of 104 students was matched on the basis of their obtained marks in pretest comprising 52 students for each experimental group and control group. Both the groups were randomly assigned as experimental group and control group. The experimental group was taught through PQ4R method whereas the control group was taught through traditional method. It was hypothesized that no significant difference exists between the mean achievement scores of experimental and control group after the treatment. The null hypothesis was tested at 0.05 level

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of confidence. The results indicated that PQ4R study strategy greatly improved the scholastic achievement of students. In the light of results, directions for future research has been given.

1 INTRODUCTION

Promoting intellectual development in schools is essential, so that all children can to become rational human beings (Ryan, 2004,p.8). This responsibility in schools lies on teachers to make their teaching effective in order to promote learning of the students.

Research studies identified that amount of time spent on learning activities, emphasizing independent learning, improving higher order thinking skills, and grouping students for individualized and small group instruction are key factors of effective teaching that are vivid indicators of effective teaching (Masrur, and Alam, 2000, p.76). Along with effective teaching strategies, the skilled teacher must know the diverse characteristics of learners and must understand the students as learners (Reddy, 2006, p.42).

Students should take full part in the learning process, because now, education is supposed to be child centered, and teaching learning process should aim at all round development of the child (Ground Water Smith et al., 2003, p.4 and Sultana, 2005,p.112). Learning is defined as a process of bringing about relatively permanent change in the behavior (Feden, 2003, p.13 & Mangal,2005, p.175). it is an active, constructive and purposive process that depends on the mental activities of the student(Sher, 2002, p.110). Theory and research on learning converge on one idea that responsibility and ability to learn rest with the student. No one can learn for someone else. It is the responsibility of the individual learner to learn at his/ her own. (Parsons et al., 2001, p.204 & Erickson, 1982, p.151). Propagators of cognitive learning theory like gestalt psychologists, Piaget, Vygotsky and Bruner maintain that all the cognitive processes and information processing involve the process of thinking.

Thinking is the process that transforms the information into new and different ways for solving a problem or reaching a goal (Feldman, 1999, p.257). Higher order thinking which includes creative and critical thinking is needed to make sense of knowledge in any subject area (Fisher, 2008, p.3). Students must be creative and critical thinkers who must be aware of their own thinking. According to Kumar (2006), “the mechanisms that control ones own thinking and learning are called metacognition” (p.4).

Metacognition is thinking about ones own thinking that involves how effectively one processes information (Parsons, et al., 2001,p.422). In the view of Faryal (2008), “metacognition is the knowledge concerning one’s own cognitive processes and products. It includes active monitoring and consequent regulation and orchestration of information processing activities” (p.83). In the view of Ashman (1997, p.149), there has been a strong and consistent emphasis on the use of self regulation procedure. Self regulation is one aspect of metacognition. According to Woolfolk (2004), “metacognition is awareness of people about their own cognitive machinery and how the machinery works. It literally means cognition about cognition or knowledge about

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one's own knowledge and learning. This metacognitive knowledge is used to self monitor and self regulate ones cognitive process such as reasoning, comprehension, problem solving, understanding and so on" (p.256).

Metacognition often takes the form of strategies (Kumar, 2006, p.4). These strategies help the students become self regulated learners. If students themselves do not pay attention, it means they do not learn (Szeto, 2010, p.3). According to Woolfolk (2004) "learners must have the ability to organize and regularize learning on their own" (p.444). It is helpful to make the students self regulated learners and engage them in enhancing their own capabilities (Thomas, 1994, p.23 and Nabeel & Liaquat, 2009, p. 100). Academic competence is related with application of effective study strategies. Due to lack of effective study strategies, intelligent learners at all grade levels may face difficulties in school learning (Gettinger, et al., n.d., p. 2). Most of the students at secondary school level fail to obtain good grades because teachers teach the content to their students but do not teach them how to learn that content.

The learning strategies, however, cannot be taught in isolation. According to Kiewra (2002) "students can learn how to learn when they are taught strategies in the context of subject matter. Instructors can teach the students how to learn by embedding strategy instruction within their content courses" (p.71). A great number of study skills and learning strategies have been identified for use. Cognitive and metacognitive strategies are proven strategies for deep understanding and reconstructive learning. According to Harley (2001, p.336), one of the best known methods for study is PQ4R method. Sanacore (2000, p.3) holds that this strategy is based on the SQ3R approach. Harley(2001, p. 336) maintains that PQ4R technique can be applied either to whole book or to just one chapter in a book. In the view of Sanacore (2000, p. 3), PQ4R method should help the student comprehend better, concentrate better, and retain better.

The PQ4R study strategy learnt in one subject area can easily be applied to many other subjects. Ormrod (1998, p.331) argues that when a student acquires effective learning strategies rather than rote learning, those strategies often transfer positively to learning in a very different situation. The PQ4R study strategy encompasses almost all other study strategies in it. It has six steps and systematically combines a whole series of important study strategies. The PQ4R strategy goes like: Preview, Question, Read, Reflect, Recite, and Review.

Preview is a rapid survey of the material that refers to gather the information to help set up mental compartment in which students fit the material. (Butcher, 2002, p.97; Sobkowiaka, 2001, p.3; Seiman, 2010, p.10; Huber, 2004, p.102; Mangal, 2005, p. 269; Bibi, 1994, p.26; Wong, 1994, p. 100; Squires, 2003, p.103; Hay, 2005, p.27; Reynolds, 1996, p.215; Ryan, n.d., p.1; Burton, 2007, p.1 and Burns, 1998, p.350).

Question: Students build questions based on the surveying they did previously. The question process lies at the heart of explaining and understanding, and gets the learner involved in work. (Simon, 2010, p.10; Sobkowiaka, 2001, p.3; Squires, 2003, p.110 and Ryan, 2004, p.171, Duffy & Roehler, 1983, P. 331). Questioning activity engages students in thinking, and

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challenges them to think at higher level (Durvin, n.d. p.1; Roger, 2006, p.116; Feden, 2003, p.118; Schafersman, 1991, p.9 and Squires, 2003, p. 110).

Read & Reflect Read and reflect process is also a thinking process, student reads the material to have the answers of posed questions. (Wong, 1994, p.103; Eliot, n.d. p.2; Hay, 2005, p.25; Ali, 1993-94, p. 135, Reynolds, 1996, p.216; Cottrell, 2001, p. 276 and Khattak and Khan, 2002, p. 31).

Recite: “one of the four R’s is “recite” which involves repeating information” (Kiewra, 2002, p.75). During recitation, students check their understanding by restating what they learnt from the selection (Reynolds, 1996, p.218, Hubber, 2004, p.108, Butcher, 2002, p. 105).

Review: Since most forgetting takes place within 24 hours, students will have to review the material to retain it. Reynolds, (1996, p.218; Klein, n.d., p.5 and Child, 1995, p.140). Ghani (1999, p.9) and Reddy, (2006, p.101) maintain that unless perpetually repeated, we usually tend to forget most of the information stored in our memory.

The research studies conducted on some of the specific study strategies like note taking, questioning, summarizing and elaborating etc. found positive effect of these skills and strategies on scholastic performance of primary or college level students. But little research appears to have been conducted on the effectiveness of PQ4R study strategy on secondary school students. The PQ4R study strategy, a new method being exercised in the West, was selected for the study to examine its effect on student’s learning and achievement in Pakistan.

2 OBJECTIVES OF THE STUDY

The objectives of the study included measuring the scholastic achievement of students at secondary school level in the subject of Pakistan Studies before the experiment, exposing the experimental group to PQ4R method of study, teaching the control group through traditional method without using PQ4R method, measuring the scholastic achievement of experimental group and after the treatment and comparing the scholastic achievement of experimental group and control group after the experiment in the subject of Pakistan Studies.

In order to achieve the objectives of the study, it was hypothesized that there is no significant difference between mean scholastic achievement scores of experimental group and mean scholastic achievement scores of control group after the treatment.

The study was delimited to : Govt. Girls High School Kahuta, urdu medium students of grade 10th, Punjab text book of Pakistan studies for grade 10th and the PQ4R study strategy.

3 RESEARCH METHODOLOGY

Following method and procedure was used to conduct the study:

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3.1 Population

Population of the study comprised secondary school girl students studying in grade 10th in the province of Punjab (Pakistan).

3.2 Sample

The sample of the study consisted of 104 10th grade students studying in Govt. Girls High School Kahuta, District Rawalpindi comprising 52 each in the experimental group and the control group. Tehsil Kahuta of District Rawalpindi was selected through probability sampling. Two sections of grade 10th students were also selected through random sampling for conduct of present study.

3.3 Instruments of the Study

Two instruments were used to conduct the present study:

- 1) The pre-test, and 2) the post-test. In the light of cognitive domain of Bloom's Taxonomy of educational objectives quoted by Feden (2003, p.19) and Shahid (2007, p.115), a 30-item multiple choice pre-test was developed from the 1st chapter of Punjab Text book of Pakistan Studies for class 10th. The time duration for the test was one hour, each item carried one mark.
- 2) The post-test was also 30-item multiple choice test developed according to cognitive domain of educational objectives quoted by Feden (2003, p.19) from the second chapter of Punjab Text book for class 10th which was taught during the experimental teaching to sample students. One hour was allotted to solve this test, each item carried one mark.

For validation of pretest and posttest, a chart of specification was designed, the selected items were reviewed and discussed with the subject teachers male and female and by research experts. Suggestion given by them were entertained. In order to determine the reliability, the pre-test was administered twice with ten day's interval on 23 girls students studying in class 10th. Product Moment correlation coefficient in the pretest was found to be .87 which according to (Garrett, 2006, p.151) is appropriate for an achievement test. The post-test was also administered twice with ten day's interval on 15 10th grade girl students. Product Moment correlation coefficient reliability was found to be 0.91 which is highly appropriate for an achievement test (Garrette, 2006, p. 151). Thus both the instruments were found to be reliable and valid for administration on the sample of the study. For both the tests, students taken from the population were, however, not included in the sample of the study.

3.4 Design and Procedure of the Study

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It was an experimental study in which the pre-test post-test control group design was used which is a true experimental design that controls for maximum numbers of threats to internal and external validity (Best, 2008, p.177, Gay, 2000, p.392, and Alam, 1990, p.99). The design is represented as:

R	O1	X	O2
R	O3	C	O4
O1 O3 = Pretest			
O2 O4 = Posttest			

Where:

R = Random assignment of subjects to groups.

X = Exposure of a group to an experimental (treatment) variable.

C = Exposure of a group to the control condition.

O1 O3 = Pretest

O2 O4 = Posttest

Following procedure was adopted for the conduct of the study:

3.4.1 Administration of the pretest

Two sections of class 10th were randomly selected and combined for the administration of pretest which was administered on 108 students who were present on test day. Researcher herself marked the papers, and matched the students in pairs on the basis of their obtained marks. A sample of 104 students comprising 52 students for each experimental group and control group were matched. These groups were randomly assigned as experimental group and control group. Each group was provided a separate classroom equal in all respects.

The researcher herself taught the experimental group by using PQ4R study strategy because no other teacher could be found well versed in this strategy. Experimenter herself studied and learnt this strategy. A teacher with similar qualification and experience taught the control group through traditional method who had no knowledge about PQ4R study strategy.

3.4.2 Training Component

Before the conduct of experiment, the experimental group was exposed to ten day's training for the use of PQ4R study strategy on easy material in social studies text book for class 7th. A period of 45 minutes was fixed each day. The researcher herself demonstrated all the six steps of PQ4R strategy before the students and let them practice on it. During this period, control group revised 1st chapter of Pakistan studies text book for class 10th which was not included in the study.

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3.4.2 Assessment and Analysis of Training

At the end of training, a 15 items multiple choice test was developed on the basis of each step of PQ4R strategy from a quite new material which was not taught to students, and administered on experimental group to check their ability in using this strategy independently. Each question carried two marks. The researcher marked the answer sheets.

In order to find out the performance level of students in using PQ4R strategy, the scores were summarized through Mean and SD. The average score on the test was 25.4 out of maximum score of 30 with standard deviation score being 3.36. this performance indicated that students were prepared for the experiment.

3.5 The Experiment

It was beginning of the academic year for class 10th, the experiment was started, one period of 45 minutes from 11:15 am to 12:00 noon from Monday to Saturday was allocated for teaching. Both the groups were taught for four weeks. Second chapter of Pakistan Studies Punjab text book was selected for teaching according to the syllabus and scheme prepared by the school. The experimental treatment incorporated all the six steps of this strategy fully through class activities under the guidance of experimenter. Both the groups completed the selected chapter simultaneously according to the time table set before the experiment. After four weeks, 30 items posttest was administered on both the groups collectively. Time duration for test was one hour. The researcher and another teacher supervised during the test.

3.6 Scoring and Analysis of Data

The data obtained through pre-test was scored, 104 students were matched comprising 52 students in each group. The data collected through the post-test was scored, and analyzed in the following way:

1. The ungrouped data obtained through pre-test and post-test from experimental group and control group were converted into grouped data in the form of frequency distributions.
2. To compare the scholastic achievement of experimental group and control group, mean, median, Q1, Q3, SD, and coefficient of variation and degree of overlapping were calculated on both the pre-test and post-test scores.
3. In order to compare the individual scholastic achievement of the experimental group with the control group students in term of overlapping (Garret, 2006, p.44), median of experimental group was used to find out the percentage of students in the control group who did better than average performance of the experimental group.
4. Significance of difference between pre-test scores of experimental group and control group, and post-test scores of both the comparison groups was determined through the use of *t* test at .05 level of confidence.

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RESULTS

Table 1

Frequency distribution of pre-test scholastic achievement scores of the experimental group and the control group.

Class Intervals	Experimental Group Frequencies	Control Group Frequencies
20-24	4	4
15-19	8	9
10-14	14	13
5-9	18	18
0-4	8	8
	N=52	N=52
	Mean = 10.44	10.44
	Median = 09.5	09.5

Entries in the above table show that the frequency distribution of pre-test scholastic achievement scores of both the comparison groups were almost equal due to their matching. The average pre-test score in terms of mean and median is also equal. The above frequency distributions are represented in the graphic form.

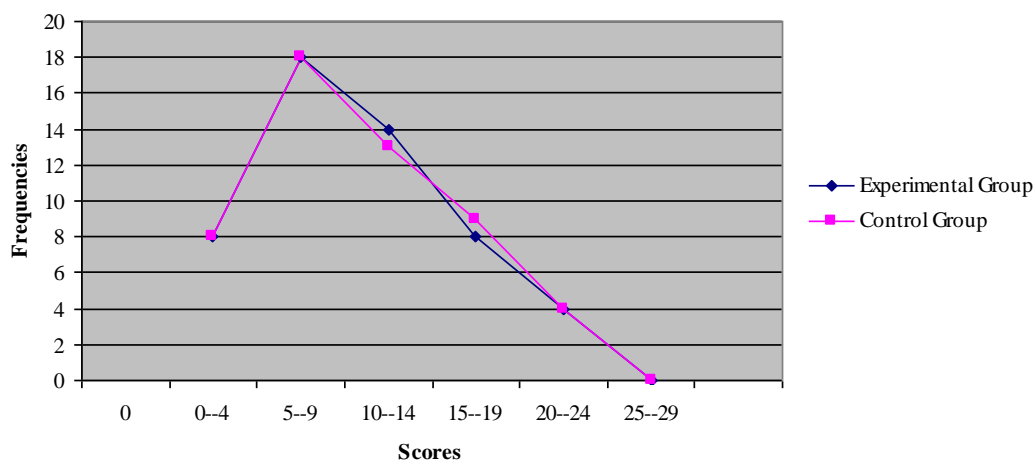


Figure 1

Table 2

Significance of difference between mean scholastic achievement scores of the experimental group and the control group before the treatment.

Groups	N	M	SD	SE _D	<i>t</i>	p
Experimental	52	10.44	5.60	1.102	0.0000	>.001
Control	52	10.44	5.63			
df = 102				t _{.05} = 1.98		

Entries in the above table show that mean scholastic achievement scores of both the groups and the spread of individual scores from the respective mean scores was almost the same. Therefore, the *t* value is zero. It implies the both the groups were equal in their academic performance in the subject of Pakistan studies before the experiment. Thus experimental group and control group fulfilled the requirement of the selected research design that the group should be equated on the dependent variable.

Table 3

Frequency distribution of post-test scholastic achievement scores of the experimental group and the control group.

Class Intervals	Experimental Group Frequencies	Control Group Frequencies
30-34	1	0
25-29	19	5
20-24	16	13
15-19	11	21
10-14	3	12
	N=50	N=51
	Mean = 21.06	17.92
	Median = 22.93	17.71

Entries in the above table indicate that frequency distribution of experimental group and control group in each class interval differs widely, especially in the intervals of 10-14, 15-19 and 25-29. 100 percent of control group and 98% of the experimental group scored between 10 and 29. The following graph represents the above frequency distributions.

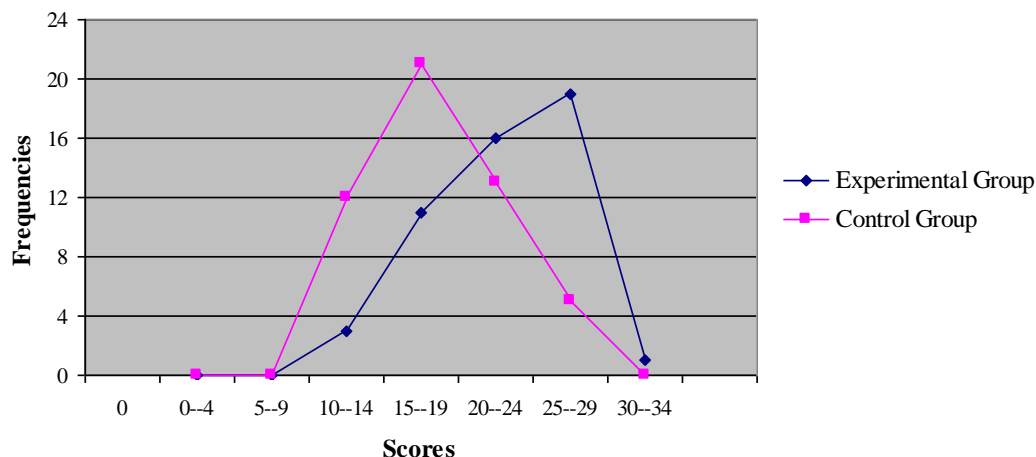
**Figure 2**

Table 4

Comparison of experimental group and control group on posttest measures of central tendency and variability.

Groups	Mean	Median	Q1	Q3	SD
Experimental	22.44	22.93	18.8	26.47	4.42
Control	17.92	17.71	14.6	21.5	4.59

As the above table shows that difference between posttest achievement of average student of the experimental group and control group is 4.52 points in favour of experimental group. The difference between median experimental student and median control student on posttest scholastic achievement is also 5.22 points in favour of experimental group. Middle 2/3rd of experimental group scored between 18 and 27 points whereas middle 2/3rd of the control group scored between 13 and 23. From the quartiles, it is evident that middle 50% the experimental group scored between 19 and 27 but middle 50% of the control group between 15 and 22. The spread of scores of both the groups around their mean is almost equal. However, the experimental group appears to show higher scholastic achievement, on the average after the treatment.

Table 5

Comparison of the experimental group and the control group on posttest scholastic achievement in terms of their overlapping.

Class Intervals	Experimental Group Frequencies	Control Group Frequencies
30-34	1	0
25-29	19	5
20-24	16	13
15-19	11	21
10-14	3	12
	N=50	N=51
	Mean = 21.06	17.92
	Median = 22.93	17.71

From the above table of frequency distributions, when the percentage of control group students who exceeded the median score of the experimental group (22.93 points) was calculated, only 20% students of the control group could be found to do better than the median student of the experimental group. It means that though experimental group did better, it does not mean that every individual student in the experimental group was better than every individual student of the control group. 20 percent students of the control group surpassed the median score of the experimental group. Yet the percentage of control students achieving higher than median of experimental group was lesser than that of experimental group, being 50 percent.

Table 6

Significance of difference between mean scholastic achievement score of the experimental group and mean scholastic achievement score of control group after the treatment.

Groups	N	M	SD	SE _D	<i>t</i>	p
Experimental	50	22.44	4.42	0.897	5.0362	< .001
Control	51	17.92	4.59			
df = 99				t _{.05} =1.98		

From the entries in the above table, it is clear that observed difference of 4.52 points in the mean scholastic achievement of the experimental and control groups was significant not only at 0.05 level but also at .001 level. The null hypothesis of the study was therefore, rejected. It is inferred that the experimental group showed better scholastic performance than the control group after the experiment.

5 CONCLUSIONS

Following conclusions were drawn from the above findings of the study:

1. The scholastic achievement of group of students taught through PQ4R study strategy and the group taught through traditional method was the same before the treatment. However the scholastic achievement of the group taught through PQ4R study strategy and of the group taught through traditional method differed widely after their exposure of PQ4R method and the traditional method of teaching respectively. Thus both the comparison groups initially equal in scholastic achievement before the experiments, really differed after the treatment.
2. Twenty percent students of the group taught through traditional method outperformed in their scholastic achievement than the average student of the group taught through PQ4R study strategy. This means that only one fifth of students taught through traditional method could achieve better than average student of group taught through PQ4R strategy. Four fifth of them, however lagged behind average scholastic achievement of the experimental group.

6 DISCUSSION

The present study was conducted to investigate the effect of PQ4R study strategy on scholastic achievement of 10th grade students in the subject of Pakistan Studies. The results of the study are discussed as under:

Although both the comparison groups were equal in their scholastic achievement before the treatment, real difference was found after the application of PQ4R study strategy. The

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experimental group outdid the control group in the scholastic achievement on post-test. This difference may be attributed to PQ4R study strategy which was applied on the experimental group during the treatment period.

The findings of the present study substantiate the previous research conducted to investigate the effect of study skills and strategies. For example, Jitendra (2000) found that due to use of review, comprehension strategies and self monitoring procedure, the experimental group performed much better than the control group in main idea comprehension. As stated by Jitendra (2000), the findings of his study were also supported by Chan, (1991); Graves, (1983); Graves and Levin, (1989); Jitendra et al., (1998) and Malon & Mastropieri, (1992) cited in Jitendra, (2000). In another study, Salim (2010) examined the impact of KWL study strategy on reading comprehension, and found positive impact on the academic achievement of those students who used it. The results of the present study were thus consistent with this study and with the study conducted by Jitendra, (2000).

Shepley and Victor (1996), Payre and Manning (1992) used a series of metacognitive strategies to enhance the reading comprehension scores. They found that the students instructed in metacognitive strategies scored significantly better than the students who were not taught through these strategies. Their results are supported by the present study. Similarly, Chang et al. (2006) found that students improved their reading comprehension scores which were strongly correlated with the use of metacognitive strategies. The results of present study are also in consonance with their study. Morill and Cynthia (1995) also supported the idea by concluding that intertwining of higher order thinking and metacognitive skills was the cornerstone for the improvement of reading comprehension. The present study results also support this point because PQ4R strategy is a combination of higher order thinking and metacognitive skills. On the contrary, however, Taylor and Frye (1992) cited in Victor (1996) investigated the effect of strategies of reciprocal teaching and summarization by using social studies text on fifth grade students who found no difference between the reading comprehension scores of the control group and the experimental group.

Related literature shows that the results of application of study strategies, such as SQ3R method have been mixed. As cited in Schurmaker (1982), some of the studies (Graham, 1977) of application of SQ3R have reported improved reading rate and comprehension after using the technique. Others have failed to do so (Mcormic and Coopers, 1991; Wooster, 1953). He further explains that in one study (Wooster, 1953), improved notes were reported. In two studies, comparing the use of SQ3R technique to other reading techniques were shown to be as good as or superior to the SQ3R technique (Niple, 1968, Willmore, 1968; Sakta, 1991). On the other hand, results of some other studies indicated that the SQ3R technique appeared to be especially useful with students needing overall reading improvement. Schurmaker (1982) referred two more investigations by Donold, (1967), Garty, (1975) about the effectiveness of the SQ3R method with seventh grade students, which yielded negative results. In both studies, no statistically different results were found between a group using the SQ3R method and one not using it. These contradictory results are in line with present study where some students took benefit significantly

from PQ4R study strategy while others could not improve their scholastic performance to the level of significance.

Moreover, new learning strategy may also be motivating for students because before the experiment, the experimenter clearly explained the benefit of use of the PQ4R study strategy which would have improved their scores in the final examination. Another factor for this change may be the training component of PQ4R strategy which was given before the experiment on easy material, a chapter of seventh grade social studies text book. Students got training willingly, and when ability test was analyzed, they dramatically scored high. Once they saw their improvement, they became more enthusiastic learners. After they had learned the strategy, their scores improved markedly. All the students expressed satisfaction with learning the strategy during the training and showed ability to generalize it. This positive effect of training component was consistent with other previous research studies such as Rodil, 2009 and Schumaker, 1982.

The students in the control group on whom traditional method of teaching was applied, also did better than their performance in the pre-test. Almost all the students strived for the excellence.

As a result they improved, but on the whole, their performance was not equal to or better than the performance of students in the experimental group. Although the experimental group as a whole was superior to the control group in their scholastic achievement, every student of the experimental group did not do better than every student of control group. Because when the difference was calculated individually in the term of amount of overlapping, it was revealed that 20% students of control group showed better performance than the average student of experimental group. Whereas, before the treatment, the medians of both the comparison groups were exactly the same. 50% students of control group and 50% students of experimental group performed above average before the experiment but after the experiment it was found that the students of control group who were 50% above average student of the experimental group were reduced to 20%. It means the performance of control group after the experiment went down by 30% as compared to experimental group.

The performance of 20% students of control group who overlapped with the performance of students of experimental group may be attributed to their practice of rote memorization and rehearsal on the material. Their memory might be strong, for that reason they might have memorized the information. Possibly, they might have been good performers who could not perform well only on pre-test due to their illness, carelessness or for any other reasons and during the treatment period they may have recovered. Ultimately, in the post-test they performed as usual. The researcher, after the experiment, realized that only the pre-test should not have been used as the sole criterion for equalizing the groups. Previous scholastic performance in at least two examinations should have been taken into account along with the pre-test.

PQ4R learning strategy is a technique to process information accurately and effectively. It can be assumed that there may be different information processing mechanisms included in

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learning due to different prior knowledge and different concepts about the material being studied by the students. Six-step PQ4R strategy requires the involvement of students' personal thoughts during the application of this strategy. Variation in the results in this study might be due to individual differences in thinking skills, reflection, and processing the information on the part of students in the experimental group.

In the present study, the students of experimental group faced some difficulties during some specific steps. In generating questions, students took much time in developing questions from the key words or phrases, whereas turning the headings and subheadings into questions was comparatively easy. Previews and reviews both were activities of collecting total image of the text. A reader previews the material before starting to read it, whereas, in the review, reader recollects the total image of the text after reading. Before reading, the reader assumes or depends on little knowledge about the text but after reading in review steps, the reader has substantial knowledge in the mind. Preview was a difficult step for some of the students because they were used to learn the material through rote memorization, and had no idea to think, assume or assess the material before reading. Reflection during reading is a critical step in personalizing and internalizing the knowledge that depends on making relations among things, events or information that varies from person to person.

The present study found the effect of PQ4R strategy holistically on the scholastic achievement of the students. It is possible that some steps of the PQ4R strategy might have overlapped other steps of the strategy. Students might have outperformed in one step but they might have lacked perfection in other steps. Had the performance of the students been assessed in all the steps of PQ4R strategy one by one, the analysis of the results would have revealed deeper results in the sense that which students used which step of the PQ4R strategy more effectively than the other one. It was observed during the treatment period that PQ4R study strategy was a time consuming strategy. All the six steps of the strategy were difficult to apply on the new material in one short period of 30-45 minutes. Inadequacy of time might have broken continuity in the steps of PQ4R study strategy. Other variables might have interrupted the learning process. However, dividing the material in suitable parts could overcome this difficulty. For instance, previewing the whole material at once, followed by generating questions, applying read, reflect, and finally reciting and reviewing the whole material might have been the proper way to use the strategy.

7 FUTURE DIRECTIONS FOR RESEARCH

The present study was carried out on the subject of Pakistan studies, however, it may not be confined to this subject only. The effect of PQ4R study strategy may be investigated in other disciplines of sciences, humanities and arts with the diverse of sample size, gender and grade levels. The standardized tests instead of teacher made tests be applied to investigate the effect of PQ4R study strategy and to confirm the findings of present study. For deeper analysis, each step of PQ4R study strategy may be investigated individually and results be interpreted separately. This study be carried out on girl students in the private sector schools. The comparison of effects

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of PQ4R strategy may be made between urban and rural school settings and between boys and girls.

In further studies, in order to provide a model for professional development of teachers in Pakistan, the teachers may be exposed to PQ4R strategy so that they can teach their students how to study effectively.

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