



## Statistical Approach: Understanding the Effects of Preview, Question, Read, Reflect, Recite, Review (PQ4R) on Academic Achievement of Students in English

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### ABSTRACT

English is an international language, but still many countries (where English is a second language) are facing problems in academics. Whereas, Urdu is the national and most common language in Pakistan, so it is hard for students to get a good command on the subject of English. Additionally, reading comprehension is also a major issue with Pakistani students, as their teachers are unaware of the cognitive and metacognitive strategies to make learning interesting and long lasting. The recent study has been conducted to compare the effectiveness of PQ4R on the academic achievement of students in the subject of English. The sample constituted total hundred students; including fifty boys and fifty girls, studying in Telecom boy's school and Telecom girl's school, respectively. A statistical approach with pre-test and post-test through Cronbach alpha; 0.76 and 0.79, respectively, was used to evaluate PQ4R strategy on 10<sup>th</sup> grade students. The statistical output revealed that PQ4R strategy improved the performance of high achievers as well as low achievers among the targeted sample.

## 1. Introduction

Pakistan is such a diverse country, where Urdu is the national language with multiple regional languages being spoken in various areas of the country. Whereas, English is mostly used in teaching and official communication. In such complex multilingual society, learning English is difficult for students at secondary level [1]. So, proper strategies need to be used from childhood to achieve national goals of education that targets the development of youth as future leaders in various levels [2].

Students often face hardships in learning and memorizing the written material, hence, various strategies are needed for effective learning of students. Among others, PQ4R is a study technique developed by Thomas and Robinson [3], that come from the acronym standing for previewing the reading material, questioning to this material, reading to answer, reflecting the reading, reciting and reviewing the material. This strategy is used mainly to help students with difficulty in reading [3, 4]. As the comprehension, retaining and recalling information is a challenge for many students. The PQ4R strategy aims at making reading easier, by taking the students on a road where everything is very vivid and signboards are there to guide them. This strategy plays a positive role in text memorization and successfully achieving student's goals [5-8], especially in brainstorming [9] defining topic or clarity of section and preparing questions that are also very beneficial in creative writing [3].

In learning English, there are four main skills required; listening, speaking, writing and reading. The most important among these, is reading [10], which is purely a

character's work out. Basically, the aim of reading should be to connect ideas on page to what a student already have an idea about and not reading to teach texts [11]. Reading comprehension is an attempt to understand, evaluate and also recognize the author's ideas given in the text. A reader needs comprehension to understand the content of a message or information from the text [12]. In case of reading's importance, it is obvious that students should be well equipped with the skills to identify what they read in everyday life [13]. The role of a teacher is very important in this regard. Broadly stated, teacher-centered classrooms need to be converted to learner based classrooms [14]. Students should not be confined to textbooks only and they may read guidebooks, content material too [15]. There are reading strategies such as: KWL (know, what, learn); IDEAL (Identifying (I), Defining (D), Exploring (E), Anticipating (A), Looking (L)); PRSR (preview, read, self-test, review) READS (Review, Examine, Ask, Do, Summarize); SQRQCA (Survey, Question, Read, Question, Compute, and Question), SQ3R (Survey, Question, Read, Recall, Review) etc [16]. The PQ4R method improves the student's reading ability, because it helps students to understand the text easily and also to remember the material that they have read [17]. This procedure indicates either a top-down, bottom up or interactive approach [18].

In comparison to other techniques, PQ4R (preview, questions, read, reflect, recite, review) strategy helps students learn the material through six steps and retain the information for a longer period. It is used to help students remember what they have read through various reading activities [19]. Through this strategy, effective problem solving can also be achieved. Moreover, the student gains

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an understanding of the material presented, raises questions, reads for information, ponders information, restates it in his/her own words, and reviews his/her thinking about the material. It may be used with individual student, small groups, and whole classes [13] and improves the student's reading comprehension and also improves recall of facts by as much as 70% [19] with the expectation of understanding the content of the read text [10].

Present study has been designed to examine the effects of PQ4R on secondary level students. This study has the following objectives:

1. To examine students' academic achievement in subject of English at secondary level through PQ4R.
2. To compare academic achievement of students of control and experimental groups of boys and girls students.
3. To perform the statistical analysis of data obtained from PQ4R teaching tool.

The hypothesis of the present research is; there is no significant difference in academic achievement of girls and boys students in the subject of English study through PQ4R method and those who are studying with traditional method. This study was conducted at the Telecom Boys Public School and College, Haripur and Telecom Girls Public School and College, Haripur, in district Haripur because of limited resources.

## 2. Methodology and Dataset

### 2.1 Methodology

In this study pre-test and post-test control designs were applied. Before taking tests, reliability of both instruments were calculated through pilot testing, which proved to be 0.76 and 0.79, respectively. Furthermore, it is assured that both teachers who were teaching (each group of boys and girls) possessed same qualification (M.A. English).

The following two research instruments were used in this study:

**Pre-test:** The draft of pre-test contained 50 multiple choice questions having four options with one correct option from the text book of 10<sup>th</sup> class English subject, including six chapters: (1) The Caliph and the Gardner, (2) After Twenty Years, (3) Population Education, (4) The Income Tax Man, (5) Begum Rana Liaquat Ali Khan and (6) The Last address of the Holy Prophet (SAW), as in the syllabus of Board of Intermediate and Secondary Education (BISE), Abbottabad.

**Post-test:** The draft of post-test contained 50 multiple choice questions with four options having one correct option from six units including: (1) Tobacco and your health, (2) Muslims of China, (3) Stopping by the woods on snowy evening, (4) It's plain hard work that does it, (5) Hazrat Umar Farooq and (6) The Kaghan Valley from text book of 10<sup>th</sup> class, as in the syllabus of Board of Intermediate and Secondary Education (BISE), Abbottabad.

### 2.2 Administration of Pre-test and Post-test

It was administrated to check the effectiveness of intervention of PQ4R through controlled experiments on 100 students (50 boys and 50 girls). Time frame was designed up to one hour to solve the test. Before starting the experiment, the teachers read and learned the PQ4R strategy. Then the experimental group of girls was taught through PQ4R strategy, as the conventional teacher of English Language was not familiar with PQ4R strategy. Whereas, the girls control group was taught by another teacher, with the same qualification, through traditional method (grammar translation method). Similarly, in the boys section an English teacher was selected with the same qualifications and trained him properly before conducting the experiment. The control boy's group was taught by another male teacher without PQ4R strategy. Meetings and discussions with teachers were conducted throughout the 12 weeks of the study.

### 2.3 Dataset

The null hypothesis was developed based on the determinist nature of the study in which researcher tried to see the cause and effective relationship between variables (needs better English). The test scores were arranged in descending order (highest on the top). The groups were further divided on the basis of pretest; even number students were placed in one group and odd in another. To check the reliability of the test, a pilot test was conducted and its results were analyzed. In order to check the validity of the test, it was cross checked by the 3 females and one male subject specialist of English having enough related knowledge and experience.

There were two control and experimental groups. Experimental groups were taught by PQ4R and the other groups were taught through traditional method (Grammar translation method). The group taught through PQ4R performed better than the control group.

The sample size included total one hundred students, fifty boys and fifty girls, who were studying in Telecom Boy's School and Telecom Girl's School at Haripur. The study was conducted on four groups: Control and experimental girls, Control and experimental boys. According to student's achievement in pre-tests, names of the students were listed in descending orders. Furthermore, they were randomly placed in both control and experimental groups making it sure that almost students of same caliber may be placed in both control and experimental groups of boys and girls. Therefore, there were 25 girls and 25 boys in Control group, 25 girls and 25 boys in Experimental groups.

### 2.4 Analysis of Data

The pre-test and post-test data were analyzed using t-test through Statistical Package for Social Sciences

(SPSS). The null hypothesis was tested at a level of significance of 0.05.

### 3. Results and Discussion

The groups were associated properly on the basis of pre-test scores (Tables 1 and 2) and the groups are linked properly for demeanor experimental research. In the light of pre-test, the competence levels of both groups were the same before the experiment [11].

The means of experimental group was 28.28 with SD of 5.74, while mean of control was 27.92 with SD of 5.58 and the calculated value of t was 0.225. At pre-test level, the means of tabulated values for experimental and control groups of girls showed non-significant difference, which means that both groups have been equated properly and students of both experimental and control group almost possessed same academic caliber (Table 1).

Table 1: Analysis of score of girls experimental and control groups at pre-test level.

Groups	N	M	SD	T	Sig. (2-tailed)
Experimental	25	28.28	5.74	0.225	0.823
Control	25	27.92	5.58		

\* Level of significance = 0.05; N = Sample number; M = Mean value; SD = Standard Deviation; T = t value

It can be seen that the mean of girl's experimental group was 41.72 with SD of 4.53, while mean of girls control group was 31.32 with SD of 5.22 and the calculated value of t was 7.517. At post-test level, the mean scores of the tabulated values for experimental and control groups of girls showed significant difference, so the null hypothesis was not acceptable (Table 2).

Table 2: Analysis of score of girls experimental and control groups at post-test level.

Groups	N	M	SD	T	Sig. (2-tailed)
Experimental	25	41.72	4.53	7.517	0.000
Control	25	31.32	5.22		

\* Level of significance = 0.05

The mean score of experimental group was 28.52 with SD of 5.55, while mean of control group of boys was 28.24 with SD of 5.62 and the calculated value of t was 0.177. At pre-test level, the mean scores of tabulated values for experimental and control groups of boys showed non-significant difference. It means that students of almost same academic ability were placed in both groups (Table 3).

Table 3: Analysis of score of boys experimental and control groups at pre-test level.

Groups	N	M	SD	T	Sig. (2-tailed)
Experimental	25	28.52	5.55	0.177	0.860
Control	25	28.24	5.62		

\* Level of significance = 0.05

The mean score of boys experimental group (Table 4) was 41.20 with SD of 3.75, while mean of boys control group was 32.92 with SD of 5.90 and the calculated value of t was 5.915. At post-test level, the mean scores of tabulated values for experimental and control groups of boys showed a significant difference, so the null hypothesis is rejected [9].

Table 4: Analysis of score of boys experimental and control groups at post-test level.

Groups	N	M	SD	T	Sig. (2-tailed)
Experimental	25	41.20	3.75	5.915	0.000
Control	25	32.92	5.90		

\* Level of significance = 0.05

Furthermore, a better performance of girls is proved as compared to the boys, in the experimental group. Also from these results, it was found that the performance of high achieving girls was better than high achieving boys of the experimental group. Similarly, low achieving girls performed better than low achieving boys in the experimental group. The result of the study shows more gains for girls as compared to boys.

The mean score of experimental group for girls was 28.52 with SD of 5.74, while mean of experimental group of boys was 28.52 with SD of 5.55 and the calculated value of t was 0.150 (Table 5). At pre-test level, the mean scores of tabulated values for experimental groups of girls and boys showed non-significant difference. It means that both boys and girls experimental groups are comprising students of almost same academic caliber.

Table 5: Analysis of score of experimental groups of girls and boys at pre-test level.

Groups	N	M	SD	T	Sig. (2-tailed)
Experimental (Girls)	25	28.52	5.74	0.150	0.881
Experimental (Boys)	25	28.52	5.55		

\* Level of significance = 0.05

The mean score of experimental group for girls was 41.72 with SD  $\pm 4.53$ , while mean of experimental group of boys was 41.20 with SD  $\pm 3.75$  and the calculated value of t was 0.442 (Table 6). At post-test level, the mean scores of the tabulated values for the girls and boys experimental groups showed insignificant difference, so the researcher was failed to accept the null hypothesis.

Table 6: Analysis of score of girls and boys experimental groups at post-test level.

Groups	N	M	SD	T	Sig. (2-tailed)
Experimental (Girls)	25	41.72	4.53	0.442	0.661
Experimental (Boys)	25	41.20	3.75		

\* Level of significance = 0.05

The mean score of high achievers in the girls experimental group was  $43.00 \pm 3.16$ , while mean of high achievers in girls control group was  $35.8 \pm 2.44$  and the calculated value in the mean scores of experimental and control groups of girls high achievers was 5.700 at post-test level (Table 7). Therefore, the hypothesis could not be accepted.

Table 7: Analysis of score of girls high achievers in experimental and control groups at post-test level.

Groups	N	M	SD	T	Sig. (2-tailed)
Experimental	10	43.00	3.16	5.700	0.000
Control	10	35.80	2.44		

\* Level of significance = 0.05

The mean score of low achievers in girls experimental group was  $40.40 \pm 4.64$ , while mean of low achievers in girls control group was  $26.9 \pm 4.55$  and the calculated value of t was 6.559 (Table 8). A significant difference was observed in the tabulated values in the mean scores of girls low achiever experimental group and control groups at post-test level, so the hypothesis could not be accepted.

Table 8: Analysis of score of girls low achievers in experimental and control groups at post-test level.

Groups	N	M	SD	T	Sig. (2-tailed)
Experimental	10	40.40	4.64	6.559	0.000
Control	10	26.90	4.55		

\* Level of significance = 0.05

The mean score of boys high achievers in experimental group was  $41.80 \pm 3.96$ , while mean scores of boys high achievers in control group was  $29.07 \pm 3.76$  and the calculated value of t was 2.313 (Table 9). A significant difference was observed in the tabulated values of the mean scores of experimental and control groups of high achievers of boys at post-test level, so the null hypothesis is rejected.

Table 9: Analysis of score of boys high achievers in experimental and control groups at post-test level.

Groups	N	M	SD	T	Sig. (2-tailed)
Experimental	10	41.80	3.96	2.313	0.033
Control	10	37.80	3.76		

\* Level of significance = 0.05

The mean score of boys low achievers in experimental group was  $39.60 \pm 3.37$ , while mean score of boys low achievers in control group was  $27.70 \pm 4.39$  and the calculated value of t was 6.789 (Table 10). A significant difference was observed in the tabulated values for the mean scores of low achievers experimental and control groups of boys at post-test level, so the null hypothesis could not be accepted.

Table 10: Analysis of score of boys low achievers in experimental and control groups at post-test level.

Groups	N	M	SD	T	Sig. (2-tailed)
Experimental	10	39.60	3.37	6.789	0.000
Control	10	27.70	4.39		

\* Level of significance = 0.05

The mean score of girls high achievers in experimental group was  $43.00 \pm 3.16$ , while mean of boy high achievers in experimental groups was  $41.80 \pm 3.96$  and the calculated value of t was 0.748 (Table 11). Insignificant difference was observed in the means of the tabulated values for girls and boys high achievers in experimental groups at post-test level, so the null hypothesis could not be proved [9].

Table 11: Analysis of score of girls and boys high achievers in experimental groups at post-test level.

Groups	N	M	SD	T	Sig. (2-tailed)
Experimental (Girls)	10	43.00	3.16	0.748	0.464
Experimental (Boys)	10	41.80	3.96		

\* Level of significance = 0.05

It is also evident that PQ4R improved achievement level of low achieving students of experimental boys and girls groups as compared to low achieving students of control groups. The mean score of girls low achievers in experimental group was  $40.40 \pm 4.64$ , while mean of boys low achievers in experimental group was  $39.6 \pm 3.37$  and the calculated value of t was 0.441 (Table 12). Insignificant difference was observed in the mean scores of the tabulated values for the experimental groups of girls and boys low achievers at post-test level, so the researcher was failed to accept the null hypothesis [16].

Table 12: Analysis of score of girls and boys low achievers in experimental groups at post-test level.

Groups	N	M	SD	T	Sig. (2-tailed)
Experimental (Girls)	10	40.40	4.64	0.441	0.665
Experimental (Boys)	10	39.60	3.37		

\* Level of significance = 0.05

#### 4. Conclusions

Results show that there is an insignificant difference between the attitude of girls and boys experimental groups in pre-test. Insignificant difference of girls and boys in control groups at pre-test is observed; while significant difference in the attitude of girls and boys experimental groups at post-test level was observed. This reveals that the experimental group performed better than the control group. Similarly, insignificant difference is also observed in the attitude of girls experimental and control groups in pre-test. It can be concluded that PQ4R should be used in classrooms for good academic performance of the students [16].

On the bases of the results obtained in this study, it is concluded that the group taught through PQ4R study strategy performed much better than the group taught through traditional method as the results showed significant difference between control and experimental groups. Furthermore, the results showed that PQ4R study strategy improved academic achievements of high and low achievers. It is proved that the PQ4R made positive impacts on the students' achievement. PQ4R improved the achievement level of the experimental group of both genders. They performed well as compared to the control group. The results of this study are aligned to the result of another study reported by Bibi and Arif [9] for significant academic improvements through PQ4R.

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