Abstract

This paper reports the result of an experiment which was conducted to determine the effect of RPT on seventh class students’ achievement in science. In this experiment students were assigned to two groups—RPT and non-RPT. RPT students were given one week training in researcher developed peer tutoring module and then an experiment of eight weeks duration was conducted. The research findings showed that the RPT and non-RPT groups differ significantly in their achievements. Students who used RPT generally reported that RPT improved their understanding of course content as well as discussed. Explanation for findings and suggestions for future research are discussed.

1. INTRODUCTION

Reciprocal Peer Tutoring (RPT) is a type of peer tutoring in which both partners of a peer tutoring pair act reciprocally as tutor as well as tutee. Fantuzzo and his associates (Piggot, Fantuzzo, & Clement, 1986; Wolfe, Fantuzzo, & Wolfe, 1986; Wolfe, Fantuzzo & Wolter, 1984) developed this procedure by noting the benefits as mentioned in some researches (Annis, 1983; Benware & Deci, 1984) related with students who act as tutor because they engage in practicing of course content while preparing to teach the tutees. And as we also know that to teach anything means to learn twice. RPT is beneficial because students gain from both – as tutor they get engaged in preparation and instruction and as tutees they receive from instruction. Fantuzzo and his associates have tested the effectiveness of RPT from time to time on different samples. Fantuzzo, King, and Heller,
1992; Piggott et al., 1986; Wolfe, Fantuzzo, et al., 1984) have tested the effectiveness of RPT on academic achievement of elementary school children (4th and 5th grades). Fantuzzo, Dimeff, & Fox, 1989; Fantuzzo, Riggio, Connelly, & Dimeff, 1989) have conducted the research on undergraduate psychology students. In all the above mentioned studies, RPT has found to have positive effect on both groups i.e. academic achievement of both groups was improved. Although these researches have shown positive results but they also have some limitations, like- only two groups of students were taken as samples – primary school children and undergraduate psychology students. Second, in experiment with undergraduates, they were responsible for generating tests, administrating it and evaluating it i.e. they have to perform all procedures by themselves.

In the present study, the purpose of the researcher was to study that whether RPT improves the seventh class students’ achievement in science. And also the students’ experience of RPT has been tried to know through interviews.

2. METHOD

- **Participants**
  The participants in the present study were 112 seventh class students enrolled in two sections of a government school located in Varanasi district of Uttar Pradesh state of India. About 45% of the students were female. The mean age of students was 12, ranging from 11 to 13. Most of them were from urban areas.

- **Measures**
  Two science achievement tests (one pre-test and one post-test) were constructed. Both tests comprised the three chapters of students’ science text book-Speed and Time, Electric Current and Its Effects and Light. The pre-test consisted of 30 items out of which 10 were of knowledge level 10 were of understanding level and 10 were of application level of Bloom’s taxonomy. The post-test also consisted of 30 items out of which 10 were of knowledge level, 10 were of comprehension level, and 10 were of application level. Each item of both tests was scored 1 if correct and 0 if incorrect. The content validity of both the tests was assessed in terms that each item corresponded to a course performance objective. Besides this, both tests were also shown to the experts in the field of education and science teaching. Reliability of both the tests was calculated by parallel-equivalence method. It comes out to be 0.81. Item- analysis of both tests indicated that each item had adequate difficulty level and discrimination index where difficulty level ranged from .40 to .80.

- **Procedures**
  The researcher had used a non-equivalent control-group quasi-experimental design. One of the two sections was randomly selected as experimental group (RPT group) and the other as control group (Non-RPT group). The RPT and Non-RPT groups contained 56 and 56 students respectively. The percentage of girls in RPT group was 47% and that of boys was 53%. In non-RPT group, the percentage of girls was 43% and that of boys was 57%. The first page of the pre-test had columns related to
demographic information of students like their sex, age and monthly family income. In the first class meeting, pre–test was administered on both groups. Then RPT group was given one week training in Peer Tutoring module developed by the researcher. They were given tips that how they have to start the lesson, how they have to clarify the concepts to their tutees, when they have to give reinforcement to their partners and how they have to give feedback to the tutees. During this period, they were paired with each other and were given one chapter to practice it. After it, eight weeks experiment was done. The non-RPT group was taught by their teachers in their routine manner and then the post test was administered on both the groups. In the last class, some students of RPT group were interviewed to know about their attitude towards RPT. They were asked the following questions – whether RPT was beneficial for them or not and what improvements they want in it?

3. RESULTS
Table 1 contains descriptive statistics for the RPT and non- RPT groups. The table shows that both the groups did not differ significantly on pre-test.

<table>
<thead>
<tr>
<th>Measure</th>
<th>RPT (n=56)</th>
<th>Non-RPT (n=56)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Pre-test</td>
<td>20.19</td>
<td>5.33</td>
</tr>
<tr>
<td>Post-test</td>
<td>24.16</td>
<td>7.39</td>
</tr>
<tr>
<td>Adjusted Mean</td>
<td>24.57</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: ANCOVA for performed experiment

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment (T)</td>
<td>1</td>
<td>16.138*</td>
</tr>
<tr>
<td>Pre-test (P)</td>
<td>1</td>
<td>2.840</td>
</tr>
<tr>
<td>T X P</td>
<td>1</td>
<td>2.396</td>
</tr>
<tr>
<td>Residual</td>
<td>109</td>
<td>(22.103)</td>
</tr>
<tr>
<td>d</td>
<td></td>
<td>0.13</td>
</tr>
</tbody>
</table>

Note. Value enclosed in parenthesis represents mean square error.

4. DISCUSSION
Table 2 shows the results of ANCOVA performed. In the analysis of covariance, the students’ pre-test score was used as covariate for post-test achievement score. The observed effect size represents very small effect (0.13 for adjusted post mean) though it is in the predicted direction. The answers in questionnaire showed that students had a positive attitude towards RPT. About 83% students said that they had been benefitted from RPT. They said that for teaching their partner, they had to do a deep learning so that they can teach their partners easily and accurately. For example, three students said that “doing studies for teaching made him / her arrange the contents systematically so
that his/ her tutee can understand it easily.” One student said that “While preparing for
teaching I had searched web and other materials which made me to do a deep learning.”
Since in RPT, there is discussion between the two partners (tutor and tutee) so some
students felt that it had increased their communication skills. For example, one student
wrote that “I learned that how to communicate with others, I have learned to give clear
explanations and now I feel more comfortable while expressing myself.”
The second question asked from students was that what improvements they want in
RPT? Regarding this, the students have given different opinions. For example one
student said that “it has given passivity in learning because tutee never comes prepared.
So, I think that all the students must be made sure for their commitment and from time
to time teachers/resource persons should also motivate them for their studies.” Another
student said that “I think I have no such deep knowledge through which I can explain the
content perfectly to my tutee. So I think that teacher should also be involved in this
process.” Another problem faced by students was that their partner was not good i.e.
both were of different nature so adjustment was their problem. For example, one student
wrote that “My tutee is very much undisciplined. He never sits quietly and listen my
talks. I think partners should be made by asking the students or friends should be
allowed to make their pairs. Then these types of problems will not occur.”

5. CONCLUSION
The findings of the study show that RPT has enhanced the students achievement in
science subject which is in line with the findings of RPT research done by Fantuzzo,
difference between previous researches and this research that the students have also been
provided instructional material so that its evaluation can also be done and it was found
to be effective. The study showed that students who participated in RPT benefited from
the experience in many ways. For example, the students said that they have done deep
learning of content which improved their understanding of subject matter. They also had
improvement in their communication skills. Generalization of the findings of this study
can be made under certain circumstances keeping in mind the sample, procedure,
content and method. It is recommended that further researches can be done by taking
large sample size, using qualitative methods and by including objective outcome
measures as well as subjective participant feedback.

6. REFERENCES
mathematics and school adjustment: A component analysis. Journal of Educational
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The Effect of Reciprocal Peer Tutoring on Seventh Class Students’ Achievement in Science


AUTHOR’S BIOGRAPHY

First Author: Anamika Yadav, is a research scholar in Faculty of Education, B.H.U. She is SRF in Education. She has done B. Sc., B. Ed., M. Ed. and Masters in English. She specializes in the area of Educational Measurement and Evaluation and Educational Technology. She is pursuing Ph. D. in Education from Faculty of Education, B.H.U. she has more than half dozen publications to her credit.

Second Author: Dr. Anjali Bajpai, is a Professor in Faculty of Education, B.H.U. She has done Masters in Botany, B.Ed., M.Ed. and Ph.D. She specializes in area of Science Education and Educational Technology. She has teaching experience of more than fifteen years. She has more than two dozen publications to her credit.