



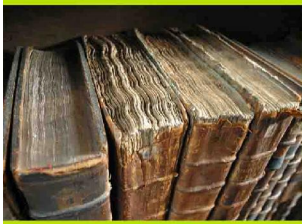
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EFFECTIVENESS OF STRUCTURED PEER TUTORING ON THE ACHIEVEMENT IN PHYSICS AT SECONDARY LEVEL

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INTRODUCTION

Physics is all around us. It is present in the minute world of the atom and in the vast universe. There is physics in our everyday life. From the moment we arise to the time we go to sleep, our activities involve physics. When we cook our food, iron our clothes, wash the dishes, listen to the radio, or answer a telephone call, we make use of the principles of physics. There is physics in moving objects, running automobiles and trains, flying kites and airplanes, zooming jet planes, and orbiting satellites. Physics is applied in the construction of roads, bridges, houses, buildings, boats, and ships. Knowing the principles of physics enables us to comprehend, appreciate, and interact better with our environment. The occurrence of lightning and thunder or a rainbow in the sky can be explained by the principles and laws of physics. We can understand why rain falls, why there is night and day, and why there is low tide and high tide.

Physics makes our lives more comfortable and enjoyable. The modern facilities in our homes such as refrigerators, washing machines, and floor polishers make our work easier. Modern means of transportation, systems of communication, and advancement in medicine, agriculture, and industry are brought about by the application of the principles of physics.

Being physics is often considered as the difficult subject of study at secondary level by the students as well as teachers, the learning of physics should be enjoyable in friendly situations not under the authoritative teaching by the teacher. This can be met by peer tutoring since their relationship between peers are totally informal. The social development can also be developed by this method of study. It also encourages learning autonomy and initiative. As far as peer tutoring is concerned, learning is a process and learner a creator.

In Indian Context, all the benefits of peer tutoring is not possible since the teacher-pupil ratio is considerably high. That can be overcome by 'structured' peer tutoring. Here the materials provided for instruction are highly structured. This method is more effective when there is a time constraint. It helps the teacher to organize and manage the class smoothly without friction.

In peer tutoring, students get all opportunity to satisfy their individual needs without any hesitation because teaching is done by his or her own classmate. It helps the students not only to get the real exposure of the textual content with the help of their mates and meet at the individual demand but also strengthens their confidence. These sort of free and fair atmospheres help the students to learn more from each other.

OPERATIONAL DEFINITION OF KEY TERMS

Effectiveness:

"Effectiveness means the use of plan for instruction or presentation which cause a desired change in learners behaviour". (Good, 1972).

In this study effectiveness means the extent to which the structured peer tutoring strategy can enhance the achievement in Physics at secondary level.

Structured Peer Tutoring:



Structured means well planned, systematic and organized. Peer tutoring is a system of instruction in which learners help each other and learn by teaching (Goodlad and Hirst 1938).

In this study, structured peer tutoring is a teaching strategy that involves learners' helps each other in co-operating working groups carefully organized by a teacher.

Achievement in Physics:

According to Thorndike and Hagen, "the type of ability test that describes what a person has learned to do is called an achievement test". Achievement in Physics refers to the total scores obtained by an individual in the test constructed covering the instructional objectives.

Secondary Level:

The term secondary refers to the third stage of prevailing educational system in Maharashtra. It includes the 8th, 9th and 10th years of schooling in the 10+2+3 patterns in Maharashtra which is an entry qualification to the higher secondary, vocational higher secondary and other technical courses in the country.

OBJECTIVES OF THE STUDY

1. To find out the effectiveness of structured peer tutoring strategy for improving the achievement in Physics at Secondary level.
2. To find out the effectiveness of activity oriented method of teaching for improving the achievement in Physics at Secondary level.
3. To compare the achievement in Physics of the students of experimental and control groups totally.
4. To compare the achievement in Physics of students of experimental and control groups with respect to following objectives namely knowledge, understanding, application and skill.

METHODOLOGY

In order to determine the effectiveness of structured peer tutoring on the achievement in Physics, the investigator adopted experimental method and followed experimental design. The pre-test and post test non equivalent parallel group design was found appropriate for this study. The pre-test was given to the students of both control group and experimental group. Experimental group was taught by using the structured peer tutoring method developed by the investigator and the control group by activity oriented method of teaching. Afterwards, the post-test was given to both the groups to find the effectiveness of the structured peer tutoring on the achievement in Physics among secondary school students over the issue based method.

Variables of the Study:

Independent variable:

1. Structured peer tutoring method
2. Activity oriented method of teaching in Physics

Dependent variable:

1. Achievement in Physics

Population and Sample:

The population comprised students of secondary schools in Maharashtra. The sample selected was the representative of the population. Since the present study is an experimental study, simple random sampling technique is used. The sample consisted of students of class VIII. Two groups each from St.Xavier's High School, Panchgani, Satara District, Maharashtra were selected for the study. Experimental group consisted of 36 students and 35 in the control group.



Tools Used:

- a. Achievement test in Physics prepared and validated by the investigator
- b. Tutors Manuals for structured peer tutoring prepared and validated by the investigator
- c. Lesson Transcripts based on structured peer tutoring
- d. Lesson Transcripts for activity oriented method of teaching
- e. Personal data sheet

Statistical Techniques used:

Descriptive statistics namely mean, median, mode, standard deviation, quartile deviation, skewness, and kurtosis would be computed for the variables in the study.

Inferential statistics such as Analysis of Variance (ANOVA), Analysis of Covariance (ANCOVA), 't' test (test of significance of means)

FINDINGS OF THE STUDY

Structured peer tutoring is found to be effective in improving overall achievement in Physics among secondary school students. ($t = 2.2$; $0.01 > p$).

There is a significantly higher achievement with respect to knowledge in Physics among secondary school students who are instructed through structured peer tutoring when compared with the students instructed through lecture cum issue based method ($t = 2.2$; $0.05 > p$).

There is a significantly higher achievement with respect to understanding in Physics among secondary school students who are instructed through structured peer tutoring when compared with the students instructed through issue based method. ($t = 3.83$; $0.01 > p$).

There is a significantly higher achievement with respect to application in Physics among secondary school students who are instructed through structured peer tutoring when compared with the students instructed issue based method. ($t = 2.2$; $0.01 > p$)

There is a significantly higher achievement with respect to skill in Physics among secondary school students who are instructed through structured peer tutoring when compared with the students instructed through issue based method. ($t = 2.2$; $0.05 > p$)

TENABILITY OF HYPOTHESES

Hypothesis 1: There is no significant difference in the overall achievement in Physics between the Experimental Group and the Control Group

Adjusted means for the post test scores were tested for significance for df 68. The 't' value obtained is 5.38. The 't' value for df 68 is 2.00 at 0.05 level and 2.66 at 0.01 level. The obtained 't' value is significant ($t = 2.2$; $0.01 > p$).

The high 't' value shows that the two means differ significantly. It means that the experimental group and the control group differ significantly. As the adjusted means score for the experimental group is higher than that of the control group, the experimental group can be said to be superior to the control group. So it can be concluded that the structured peer tutoring strategy is statically effective than the activity oriented method of teaching for enhancing the overall achievement in Physics among the secondary school students. Hypothesis 1 is rejected on the grounds of the statistical analysis.

Hypothesis 2: There is no significant difference in the achievement of secondary school students in Physics taught through structured peer tutoring and that of students taught through activity oriented method of teaching method with respect to knowledge.



Adjusted means for the post test scores were tested for significance for df 68. The 't' value obtained is 2.2. The 't' value for df 68 is 2.00 at 0.05 level and 2.66 at 0.01 level. The obtained 't' value is significant ($t = 2.2 ; 0.05 > p$).

The high 't' value shows that the two means differ significantly. It means that the experimental group and the control group differ significantly. As the adjusted means score for the experimental group is higher than that of the control group, the experimental group can be said to be superior to the control group. So it can be concluded that the structured peer tutoring strategy is statically effective than the activity oriented method of teaching for enhancing the knowledge of Physics at the secondary school students. Hypothesis 2 is thus rejected on the grounds of the statistical analysis made.

Hypothesis 3: There is no significant difference in the achievement of secondary school students in Physics taught through structured peer tutoring and that of students taught through activity oriented method of teaching method with respect to understanding.

Adjusted means for the post test scores were tested for significance for df 68. The 't' value obtained is 2.2. The 't' value for df 68 is 2.00 at 0.05 level and 2.66 at 0.01 level. The obtained 't' value is significant ($t = 3.83 ; 0.01 > p$).

The high 't' value shows that the two means differ significantly. It means that the experimental group and the control group differ significantly. As the adjusted means score for the experimental group is higher than that of the control group, the experimental group can be said to be superior to the control group. So it can be concluded that the structured peer tutoring strategy is statically effective than the activity oriented method of teaching for enhancing the understanding of Physics at the secondary school students. Hypothesis 3 is rejected.

Hypothesis 4: There is no significant difference in the achievement of secondary school students in Physics taught through structured peer tutoring and that of students taught through issue based method with respect to application.

Adjusted means for the post test scores were tested for significance for df 68. The 't' value obtained is 3.43. The 't' value for df 68 is 2.00 at 0.05 level and 2.66 at 0.01 level. The obtained 't' value is significant ($t = 2.2 ; 0.01 > p$).

The high 't' value shows that the two means differ significantly. It means that the experimental group and the control group differ significantly. As the adjusted means score for the experimental group is higher than that of the control group, the experimental group can be said to be superior to the control group. So it can be concluded that structured the peer tutoring strategy is statically effective than the activity oriented method of teaching for enhancing the application level of Physics at the secondary school students. Hypothesis 4 is rejected.

Hypothesis 5: There is no significant difference in the achievement of secondary school students in Physics taught through structured peer tutoring and that of students taught through activity oriented method of teaching method with respect to skill.

Adjusted means for the post test scores were tested for significance for df 68. The 't' value obtained is 2.21. The 't' value for df 67 is 2.00 at 0.05 level and 2.66 at 0.01 level. The obtained 't' value is significant ($t = 2.2 ; 0.05 > p$).

The high 't' value shows that the two means differ significantly. It means that the experimental group and the control group differ significantly. As the adjusted means score for the experimental group is higher than that of the control group, the experimental group can be said to be superior to the control group. . So it can be concluded that the structured peer tutoring strategy is statically effective than the activity oriented method of teaching for enhancing the skill of Physics at the secondary school students. Hypothesis 5 is thus rejected.

CONCLUSION



- The structured peer tutoring method, a learner centric approach as well as the activity oriented method of teaching which is essentially a teacher centric approach, are effective in enhancing the Achievement in Physics. But the peer tutored students showed a greater achievement in the subject concerned. Thus the study confirms that the higher achievement in Physics is due to the effectiveness of structured peer tutoring strategy.
- There is significant difference in the achievement between the pupils who are instructed through structured peer tutoring method and the activity oriented method of teaching. The pupils who are structured peer tutored (experimental group) are superior in overall achievement in Physics when compared with those who are teacher tutored.
- The experimental group and the control group made a high overall achievement in the post-test in Physics in terms of knowledge, understanding, application and skill when compared with the pre test. However the experimental group made a great leap in the achievement than that of the control group. It can be concluded that structured peer tutoring is not only effective in improving the overall achievement in Physics but also effective in enhancing the components like knowledge, understanding, application and skill.

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