

To Study the Significance of Power Point Presentation in Classroom Teaching

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Abstract

Learning is the understanding of the concepts and not only memorizing. It consist of observing, imitating, reading, experimenting, thinking, analyzing, writing, inferring, debating, discussing and many more other activities. Out of these activities only few are covered by classroom teaching which causes some problems in understanding the concepts. To avoid problems in this paper, we discussed the introduction and implementation of PPT method in the classroom teaching and studied the significance of this method. For this study we divide the students of first year B.Sc. in to two homogeneous groups on the basis of their pre test score. Two different teaching learning methods were employed for control and experimental group students. The significance of teaching through PPT method was studied by using statistical methods such as Mean, Standard deviation and t-Test. In the present study we observed that the teaching through PPT method enhanced the understanding of concepts and also retaining of knowledge among the students.

KEY WORDS: Teaching learning methods, Interactive methods, Statistical analysis, Physics.

INTRODUCTION:

Learning is the understanding of the concepts and not only memorizing, which needs active involvement of the learner instead of passive learning and observing. Learning consist of observing, imitating, reading , experimenting, thinking, analyzing, writing, inferring, debating, discussing and many more other activities. Learning requires discovery of relevant information out of various sources like print and non-print materials. The advance in instructional and communication technologies and multimedia computers have significantly modified the scenario of learning in last 2 decade.

It is well known and accepted fact that there is no universal way of learning. A learner may use different methods for learning different tasks.

The Learning takes place in the variety of ways such as home, schooling, traditional classroom based learning, distance education, and currently a computer based learning S. K. Thorat (2012). These methods are significantly different and accepted worldwide. Out of these, much attention is focused on the computer-based learning due to their capabilities and effectiveness Beáta Jarosievitz (2005), Holubova and Renata (2008), Beáta Jarosievitz (2009), González, J. A. Mesa González, (2009), Beáta Jarosievitz (2011).

Limitations of Classroom teaching method:

1. Slow delivery of lecture for weak students, injustices to the faster ones, because they may wish to jump ahead. Jumping ahead or faster delivery again would be confusing the slower student. Thus coping with slower and faster students simultaneously in a class is a difficult task.
2. The environment in classroom, learning is accomplished with the instructor actively presenting information and the students passively observing or listening.
3. Teacher cannot visualizes the concept and performs experiment in the classroom, to enhance teaching learning effectively.

These limitations increase difficulties to understand basic concepts and to increase the alternative frames (problems) about the concepts. The alternating frames give resistance to learning the concepts and their applications in different fields.

Significant contributions to alternative frames about basic concepts have been made by many researchers; some of them are Clement 1982, Gillbert and Watts (1983), Brown & Clement (1989), Hammer (1996), Chi, M. T. H. (2005), Brown & Hammer (2008), Gupta et al (2010) and Mashood and Singh (2012). Prior knowledge of the alternative frames among students can be the basis for the generating discussion and planning of strategy to help the students in acquiring the correct concepts and to make them to think in the scientific way. Many researchers have been designed modeling techniques for better understanding of the physics concepts Raghavin and Glaser (1995), R. Devi et al (1996), I. Houlloun (1996), Greca and Moreira (1997), Harrison and Treagust(2000), E. Etkina, et al (2006).

Concepts of mechanics are very fundamental in basic Physics. It's effects are distinctly discernible in dynamics, Kinematics and other branches of Physics.

The students lost interest and get deprived of the natural joy of learning of the subject like Physics. Thus, the traditional lecture method cannot good to the students. The method of PPT can solve the problems of teaching the topics like Kinematics, Newton's Laws of motion, and Work-Energy. This task also helps for active participation of the students.

In this research project, I have designed a PPT on the topics of 'Kinematics, Newton's Laws of motion, and Work-Energy' at F.Y.B.Sc. in University of Pune. An attempt has been made to visualize the concepts so that students should understand them properly and their basic knowledge about the topics should be increased. For that, I have design two group of students they are:

- 1) Traditional teaching method (Control group)
- 2) Teaching through PPT (Experimental group)

The effectiveness of these methods were studied by using statistical methods such as mean, t-test, standard deviation etc.

MATERIALS AND METHODS:

Preparation of PPT materials:

The detailed structure (contents) of PPT is as given below:

Module – I- Fundamental Physics *Module – II- Physical quantities:*

- | | |
|--------------------------|-------------------------|
| 1 Fundamental quantities | 1 Fundamental quantity. |
| 2 Mechanics | 2 Derived quantity. |
| | 3 Vector quantity. |
| | 4 Scalar quantity |

Module – III- Mechanics:

- 1 Motion
- 2 Work-Energy
- 3 Power.

Module- IV- Motion:

- 1 Types of motion.
- 2 Kinematics.
- 3 Newton's laws of motion (Dynamics)

The division of course contents and its arrangement in the script is according to standard reference books Landau L. D. and Lifshitz E. M, (1972), Kleppner, D. and Kolenkow, R. J. (1973), George Gamow and John M. Cleveland (1978), Feynman, Richard, (1999), David Halliday et al (2001), Sears and Zeemansky, (2003), P.S. Tambare et al (2008).

Contents of chapters and their learning objectives:

Chapter I: - Kinematics:

Learning objectives:

To study what is Kinematics?, to study Description of motion with position & time graph; Describing Motion with Velocity vs. time Graphs; To study Acceleration Vector; also to study the Kinematics equation and their applications.

Chapter II: - Newton's laws of motion

Learning objectives:

To study Newton's laws of motion. To understand the basic concepts inertia, conservation of momentum, force. To study the Newton's law of Gravitation.

Chapter III: - Work-Energy:

Learning objectives:

To understand the basic concept Energy, Work done. To study work energy theorem and to study the mass energy equivalence.

Design structure of Power Point Presentation

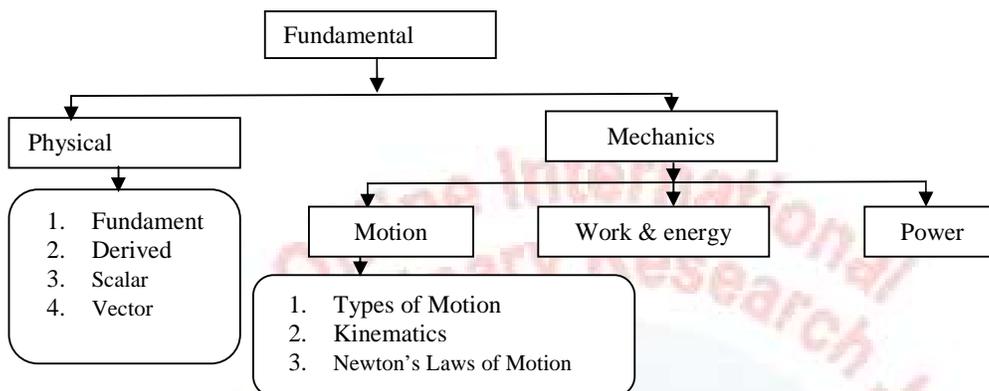


Fig1. Design structure of PPT

Sampling:

In the second phase of study the target group sample is divided in two groups for the comparison of checking effectiveness of traditional classroom teaching method. And use of multimedia PPT method in terms of post test.

Total population and group wise sampling:

Table: I.1 Total population and group wise sampling:

Total population:

| Class | Total students | Male | Female |
|-----------|----------------|------|--------|
| F.Y.B.Sc. | 135 | 78 | 57 |

Sample selected for two group:

| Class | Total selected students | Male | Female |
|---------------|-------------------------|------|--------|
| F.Y.B.Sc. | 30 | 20 | 10 |
| Control group | 15 | 10 | 5 |
| Expt. Group | 15 | 8 | 7 |

The experimental research method followed by the researcher is pre-test – post-test control group design. In this method, internal sources of invalidity (History, maturation, testing, instrumentation etc.) are controlled. The external sources of invalidity are not concentrated in this research work.

Methods:

Step I: Students of F.Y.B.Sc. (Physics) class is divided into two group from the result obtained of pre-rest. This test is also helpful to understand the pre-knowledge about

the topics ‘Kinematics, Newton’s Laws of motion, and Work-Energy’.

Step II: For pre-test 30 students of F.Y.B.Sc. class are selected on the basis of result obtained from pre-test and are divided into two homogeneous groups.

(Their average is nearly equal)

- Group1 Control group Traditional teaching.
- Group2 Experimental group Traditional teaching +Teaching through PPT.

After teaching, two post-test will be conducted with interval of 30 days. From the obtained marks we will check the effectiveness of PPT, with the help of Statistical methods e.g. Mean, Mode, Median etc. After that, the spreading of marks around the mean has been studied.

Research Work Structure:

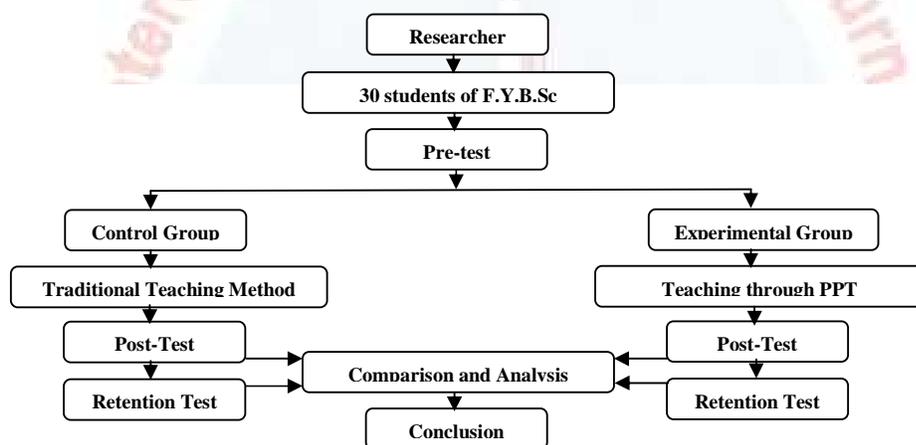


Fig 2. Research work structure.

The tools prepared to study the effectiveness.

To see the effectiveness of the PPT three different tools are prepared.

1. Pre-Test
2. Post or Achievement test
3. Retention test

Pre-test & Post-test:

Pre-test and post (Achievement) tests were prepared to test the effectiveness of learning through PPT of Kinematics, Newton’s laws of motion, and Work-Energy, and traditional teaching method.

A test was designed to measure the knowledge or skill of a learner, as a result of classroom and PPT. Such testing produce a statistical profile used as a measurement to evaluate students learning in comparison with standard norms.

Preparing question bank: Researcher has to prepare a question bank of multiple choice types of items, and answers in one sentences, because these items measure learning outcomes with respect to following taxonomical categories. These are

- 1) Basic knowledge
- 2) Understanding
- 3) Application

The pre-test, post-test, retention test initially consists of two questions. Question 1st consists of 10 items, each having one marks and question 2nd consists of 15 items, each item having two marks. Therefore total marks of the pre-test, post-test and retention tests are 40 each.

RESULT AND DISCUSSIONS:

Statistical Analysis:

The analysis was carried out for comparison of

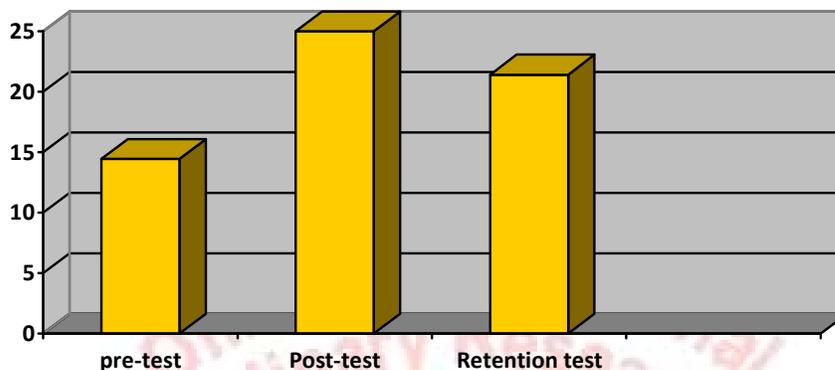
- 1 Pre and post-test data.
- 2 Post-test of CG and post-test of EG- data.
- 3 Retention test of CG and retention test of EG data.

The goal of this research is to compare the learning outcomes of two different instructional methods, namely traditional classroom method and teaching through PPT. To establish the effectiveness of the PPT in topics of Kinematics, Newton's laws of motion and Work-Energy, the data collected through various tests of selected target groups are processed, statistically analyzed and graphically presented.

Control group analysis:

Table1: Control group analysis

| Test | No. Of Students | Mean | Standard Deviation | T Score |
|-----------|-----------------|----------|--------------------|-----------|
| Pre | 15 | 14.46667 | 4.533473 | PP-10.799 |
| Post | 15 | 25 | 2.951997 | PR-7.2211 |
| Retention | 15 | 21.4 | 3.224903 | RP-8.2217 |



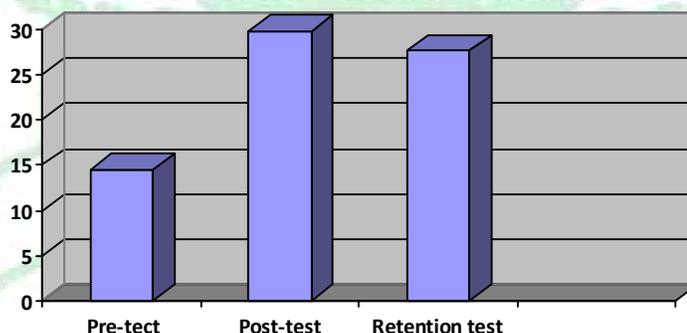
Graph1: Mean against test type for control group analysis

From the above table and graph it is concluded that, the statistical analysis for calculating ‘t’ indicates that ‘t’ for post and pre (PP) test is 10.799, for post and retention (PR) test is 7.2211, and for retention and pre (RP) test is 8.2217 for 14 degree of freedom (i.e. size N = 15). These values of ‘t’ are higher than the standard or table value of ‘t’ which is 2.145 (for 5% level of significance) and 2.977 (for 1% level of significance). It shows that the learners’ performance in the two stages have significant difference. It also indicates that in traditional teaching method learners have acquired knowledge up to the significant level.

Experimental group analysis:

Table2: Experimental group analysis

| Test | No. Of Students | Mean | Standard Deviation | T Score |
|-----------|-----------------|---------|--------------------|------------|
| Pre | 15 | 14.4666 | 3.7645 | PP-18.801 |
| Post | 15 | 29.8 | 4.296178 | PR- 2.1087 |
| Retention | 15 | 27.6 | 4.641428 | RP-9.7671 |



Graph2: Mean against test type for Experimental group analysis

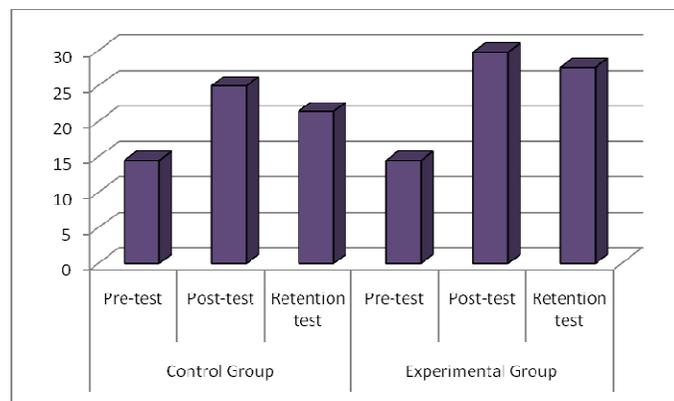
From the above table and graph it is concluded that, the statistical analysis for calculating ‘t’ indicates that ‘t’ for post test and pre test is 18.801, and retention and pre test is 9.76715 for 14 degree of freedom (i.e. size N= 15). This value of ‘t’ is higher than the standard or table value of ‘t’ which is 2.145 (for 5% level of

significance) and 2.977 (for 1% level of significance). It shows that the learners' performance in the two stages (i.e. post and pre, and retention and pre) have significant difference. It indicates that the teaching through PPT is more effective than traditional teaching learning method.

't' for post and retention is 2.1087 for 14 degree of freedom (i.e. size N= 15). This value of 't' is nearly equal to standard or table value of 't' which is 2.145 (for 5% level of significance) and 2.977 (for 1% level of significance). It shows that the learners' performance in the two stages (i.e. post and retention) have insignificant difference. It indicates that the retaining of knowledge is good in this type of teaching learning method.

Comparative Analysis:

Mean Analysis:



Graph 3: Comparative mean analysis of two group

Standard Deviation analysis: All test data values are such that the standard deviation values are below 5 this shows that the data and their analysis losses probabilistic nature and are deterministic.

CONCLUSION:

The comparison of result of the test conducted on selected groups - Control group and Experimental group reveals that, post-test scores of Experimental group hiked over the results of other group. This shows that PPT developed by researcher on topics Kinematics, Newton's Laws of motion, and Work-Energy is effective to enhance their ability of understanding the concepts and skills in problem solving. The achievements are significantly higher in target group i.e Experimental group on topics Kinematics, Newton's Laws of motion, and Work-Energy. Further, the PPT used as a teaching resource to teach target group is still more effective than other group.

Also it has been noticed that, the scores of retention test are comparatively higher than pre-test. Thus the result indicates that the PPT does help the students to enhance their acquisition of knowledge, conceptual understanding, skill development and retaining the information. Thus the result of PPT on topics Kinematics, Newton's Laws of motion, and Work-Energy helps the students to retain knowledge, conceptual understanding and skill development.

Difference in knowledge gain and knowledge retention is observed. This difference is comparatively small and it may be due to the time gap between the post-test and retention test stages of the study and may be due to the absence of the reinforcement between the phases.

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