

**“A STUDY OF EFFECTIVENESS OF USE OF COMPUTER  
TECHNOLOGY IN TEACHING THE CONCEPTS OF  
PHYSICS AT SENIOR SECONDARY LEVEL”**

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# ABSTRACT

Computer technology is one of the factors changing the face of our schools and creating special challenges. "Computer is the most talked topic in the present society and it is an area which has crossed all barriers and boundaries of age and profession adjusting everyone on the same platform which is "Learning." Computer technology is an interactive technology. Students become actively involved in the ownership of learning. Computer technology can be effectively used to teach the concepts of physics. For example atomic structure and atom models can be explained with custom animation. Websites like [www.encarta.msn.com](http://www.encarta.msn.com), [www.northernlight.com](http://www.northernlight.com) help to visualize nuclear reactions. Websites like [www.sdss.org](http://www.sdss.org) help the students to have access to innumerable digital pictures of galaxies and their magnificent shapes.

After consulting the experts in physics a questionnaire was prepared and administered to fifty teachers. This contained questions on teachers' qualifications, their teaching experience, computer training, teaching methods, difficult topics in class 11 and 12 to be taught by lecture method etc. There were also questions related to computer technology. This questionnaire was circulated to fifty physics PGTs teaching physics at senior secondary level in government, government aided and public schools and their responses were studied. NPSC (National Progressive Schools Conference) school students were considered to undergo achievement tests. The topics for the tests were identified by the teachers teaching physics at senior secondary level in Delhi. Five difficult topics in class 11 and fifteen difficult topics in class 12 were considered. Two experimental groups and one control group were considered for the research study among the students.

They are;

Experimental group 1 - learning by computer assisted teaching

Experimental group 2 - learning by accessing computers without the aid of the teacher

Control group 3 - learning by traditional method of teaching.

In group 1 the teacher (the Investigator) used the computer technology in his teaching. In group 2 the students used computer technology to learn the concepts of physics without the aid of the teacher. In group 3 the teacher (the Investigator) used only the traditional method.

The Investigator himself prepared some software materials using MS DOS and his own website <http://makadelhi.tripod.com>. He also procured two CDs. Lectures were prepared in all these twenty topics. In case of computer assisted teaching group (i.e. group 1), the teacher (the Investigator) used the software materials using computer while delivering the lectures to explain the concepts of physics. After each topic was taught achievement test was conducted under the invigilation of the teacher. The test papers were evaluated and the marks obtained by the students were tabulated. Thus the data were obtained for all the three groups in all the tests.

In senior secondary physics when the teacher used adequate computer materials along with his well prepared lectures it yielded good results. The students understood the basic concepts in physics very well and performed

better in the achievement tests. When all the twenty topics were considered at the senior secondary level the mean value of scores for computer assisted teaching group (group 1) is 56.4, the mean value for computer accessed learning (without the aid of the teacher) group (i.e. group 2) is 42.97 and the mean value for traditional method group (group 3) is 40.11. In observing the over all data very critically it is seen that the highest number of students in group 1 got 67 to 100%. The mean value of percentage of the students getting 67 to 100% marks for group 1 (computer assisted teaching) is 37.99. The mean value of percentage of the students getting 67 to 100% marks for group 3 (traditional method) is as less as 10.46. Number of students getting 67 to 100% in only computer accessed learning group (group 2) lies in between that of the first and the third. Finally from the statistical analysis it has been observed that there is no correlation between scores of any two groups; then t-tests were conducted to find out any significant difference between the groups. There is significant difference between computer assisted teaching method (group 1) and method of learning by accessing the computer technology without the aid of the teacher (group 2) as t – calculated value 2.605 exceeds t – critical value 2.021 for  $df = 38$ . There is also significant difference between computer assisted teaching method (group 1) and traditional teaching method (group 3) since t - calculated value 4.328 exceeds t – critical value 2.021 for  $df = 38$ . But there is no significant difference between method of learning by accessing the computer technology without the aid of the teacher (group 2) and traditional method of teaching (group 3) as the calculated value of t is less than the critical value of t. Here since t value 0.619 is less than 2.021 for  $df = 38$  the null hypothesis is accepted.

Hence from the analysis of data, the critical data observation and the statistical method we very clearly and precisely come to know that the computer assisted teaching is the best method to teach the concepts of physics at senior secondary level. There is no much profitable learning by the students just by using computer technology to learn the concepts of physics without the aid of the teacher or by the traditional method of teaching physics.