MATHEMATICS TEACHING ENHANCEMENT BY THE EFFECTIVE COMPUTER ASSISTED INSTRUCTION AND TRADITIONAL METHOD AT HIGHER SECONDARY LEVEL IN MURSHIDABAD

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Abstract: The prompt improvement in the instructional technology are Programmed Instruction (PI), Computer Based Instruction (CBI), Computer Based Learning (CBL), Modular Approach, Web Based Learning (WBL) and Computer Assisted Instruction (CAI). These can be conducted to oversee the egregious differences. All of these methods can be standing to the individual's pace of learning and successful for yielding individualized instructions. Among these individual-learning methods, Computer Assisted Instruction (CAI) has subjugated the teachers to conduct it for teaching. Now days, CAI is being conducted for giving instructions to the students at isolated levels to update their knowledge. The objectives are to assimilate the learning effects of two groups of learners studying the same Mathematics curriculum. One group is taught through traditional method and the other group is taught conducting CAI lay-out instruction. To develop computer assisted instructional package on the topic determinants and matrix of Mathematics curriculum. To assimilate the mean scores related to the achievement of the control group and experimental group in their pre test. To study whether there is significant difference in the scores concerned to the achievement of pre test and post test of the control group. To find out whether there is significant difference in the scores concerned to the achievement of pre test and post test of the experimental group. To assimilate the scores concerned to the achievement adopted by the control group and experimental group in their post test.

Keywords: CAI, control group, experimental group, mathematics teaching, traditional method.

INTRODUCTION

The main aim of education is to perpetuate, dispose and advance knowledge. In the past, this aim was acquire with the collaboration of teachers, books and some audio visual aids. However, a number of problems were envisaged in the prosperity of education. These include problems of mountainous classes, heterogeneous classes with special differences, deficiency of textbooks and source components etc. Moreover, remaining to information explosion the objectives of education have become multidimensional. It is complex to acquire those objectives by conducting lecture method only. There is a need of some humble methods of teaching. The solution of these problems can only be grappled by the conduct of technology in the education system.

The prompt improvement in the instructional technology are Programmed Instruction (PI), Computer Based Instruction (CBI), Computer Based Learning (CBL), Modular Approach, Web Based Learning (WBL) and Computer Assisted Instruction (CAI). These can be conducted to oversee the egregious differences. All of these methods can be standing to the

individual's pace of learning and successful for yielding individualized instructions. Among these individual-learning methods, Computer Assisted Instruction (CAI) has submissive the teachers to conduct it for teaching in present scenario. Now days, CAI is being chronicled for giving indications to the students at different levels to update their learning. CAI is one of the most effective methods of giving specialized and self-paced indications to the learners in classroom circumstances. It covers a wider range of special differences. It is conducted for introducing the pedagogical material automatically to the learners.

In recent years, a number of multiplicand has ensouled change in the teaching of mathematics, particularly at upper primary, secondary and undergraduate levels. Permutations have been made in the enhancement of courses and curricula and in the teaching methods. Proceeding technology has revealed many portals in mathematics education. The use of computer-based teaching in mathematics gives number of alternatives to students such as visualization of abstract concepts that will encourage student understanding. These alternatives would be supplementary to traditional teaching. Computer assisted instructional materials are major effective in revealing fortunate attitude, and in capturing interest, creative mentality, thinking and emotion towards learning mathematics. The computer simulations arranged to be conducted in teaching performances are able to originate a teaching ambience like laboratories where students are capable. A inequality of observable delegation of mathematics thoughts in the computer simulations build concepts visible that are otherwise invisible to students.

BACKGROUND OF THE STUDY:

Computer Assisted Instruction (CAI) has been giving an effective medium of education in the flourished countries for formal, informal and non-formal education at all the levels in present scenario. The conduct of computers in the classroom has growled since the 1980s but studies within the past 15-20 years have focused on the relevance between CAI and academic achievement in various subject areas in diverse level. Number of studies has been enacted to find the effectiveness of CAI at different levels. Sindhi, N.O. (1996), Nalayini (1998), Sharma and Sansanwal (2002), Perkins et al. (2006), Finkesteinet. et al. (2005) enacted the studies to find out the utility of CAI in teaching learning of Physics at different levels. They establish a good enhancement in scores of the learners by conducting CAI. It was found that secondary students exposed to CAI emerged higher academic achievement than the students open-eyed to traditional instructions did.

EMERGENCE OF THE PROBLEM

Furious development in Information and Communication Technology transfer the methodology of teaching and learning mode of Mathematics. Acquiring knowledge conducting CAI is a emergent segment of Mathematics learning. At impending situation students are less interest about mathematics subject. They are captivating themselves in computer games, social networking sites, detached from their diurnal life activity. In a new situation they don’t know how to behave, how to deed, how to carry through, how to nimble their feelings, actually they are not conscious about what they are ascertain. In this endeavour

the study will search out the Mathematics teaching enhancement by the effective computer assisted instruction and traditional method at the level of higher secondary.

REVIEW OF RELATED STUDIES:

Nalayini (1998) promoted and affirmed the computer-assisted instruction in Physics for high school students to perusal the yielding of computer-assisted instruction on learning the notions in the topic "Electricity" in physics. The findings of the yielding emerged that the achievement in the post-test of the experimental group is higher as likened to control group and the experimental group dissents significantly when likened to control group. Hence learning through computers helped in achieving excellent than the control group.

Kausar, Choudhry and Gujjar (2008) have done a comparative perusal to evaluate the utility of CAI versus Classroom lecture for computer science at ICS level and construct that total gain in cognitional field by CAI was significantly higher to the entire benefit in cognitional field by CRL teaching method.

Ramani and Patadia (2012) discussed the effectiveness CAI in teaching Arithmatic. They construct that CAI with simultaneous discussion is more utility than traditional method.

Mahmood (2004) conveyed a perusal on CAI and traditional method of instruction. This study explored the reach of computer-assisted instruction on student achievement in general science as likened to traditional method of instruction. The result exposed that the experimental group out sailed the control group in all achievement areas i.e. all-up, by levels of cognitive domain and by type of kernel. Students like the CA program and obliged from it. They construct it better mode of instruction than the traditional method.

Mintz (2000) and Campbell(2000), as recovered by **Mahmood** (2004), likened computerized and traditional instruction in the area of elementary Mathematics and elementary reading. It was construct that there was significant difference in critical thinking skills between students who obtained CAI and students that did not.

Sharma and Sansanwal (2002) likened into video-based pedagogical process for teaching science at level of class IX in terms of achievement. The brainchild of the study disclosed that the treatment had significant effect on achievement in science of students belonging to different video-based instructional strategies for teaching science and the video viewing followed by lecture as well as video viewing imitated by conversion were significantly higher than those of video observing only. Also the mean scores of science achievement of video observing imitated by lecture were constructed to be significantly superior to video observing imitated by conversion.

STATEMENT OF THE PROBLEM:

Various researches were executed on the teachers' involvement to educate teaching mathematics cleverness progress using CAI. Few researches had been executed on teaching mathematics cleverness progress at primary and secondary level of students. No research construct on attitude towards Mathematics teaching enhancement by the effective computer

assisted instruction and traditional method at higher secondary level especially at Murshidabad district. So, in this respect their enhancement of teaching mathematics is an instant task for compassionate their accomplishment in near futurity.

So the problem is revealed as to pardon the- **Mathematics teaching enhancement by the effective computer assisted instruction and traditional method at higher secondary level in Murshidabad**

OBJECTIVES OF THE STUDY:

The objectives are to liken the learning yielding of two groups of learners perusing the same Mathematics curriculum. One group is taught through traditional method and the other group is taught putting on CAI format instruction. The objectives are

a) To construct computer assisted instructional package on the topic determinants and matrix of Mathematics curriculum.
b) To liken the mean scores connected to the achievement of the control group and experimental group in their pre test.
c) To study whether there is significant difference in the scores connected to the achievement of pre test and post test of the control group.
d) To find out whether there is significant difference in the scores connected to the achievement of pre test and post test of the experimental group.
e) To liken the scores connected to the achievement obtained by the control group and experimental group in their post test

HYPOTHESIS OF THE STUDY:

The following hypotheses are

H_1 : There is significant difference between the mean scores connected to achievement of pre test of experimental and control group.

H_2 : There exists significant difference between the mean scores connected to achievement of pre test and post test of the control group.

H_3 : There is significant difference between the pre test and post test gain scores of achievement of the experimental group.

H_4 : There is significant difference between the post test scores of achievement of control group and experimental group.

SIGNIFICANCE OF THE STUDY:

In a present world, where our synthesized voice possesses us when to bent to receive from one point to another point, a interrogatory arises now days. Doing student really need to learn how to acquire knowledge in teaching mathematics conducting CAI? The answer is yes. Because,

(i) We have many efficiency inherently;
(ii) The learners will prepare arithmetic unit with the help of CAI along with the simultaneous discussion guided by the investigator with students where ever and whenever needed.
(iii) The belief of the students of experimental groups concerning the learning mode of arithmetic unit.

So, in this context to measure the Mathematics teaching enhancement by the effective computer assisted instruction and traditional method and their achievement is momentous. Because after the school level they are enter into a broad world where they need to construct some efficiency on the basis of prior knowledge for their better future.

DELIMITATION OF THE STUDY:

i) This study has not looked for alternatives of CAI such as internet or distance learning.
ii) Computer conduct is confined to the presentation of curriculum only.
iii) The higher secondary schools under W.B.C.H.S.E. are choice for the research work.
iv) The subjects of the study are confined to higher secondary level Mathematics only.
v) The sample include girls and boys as study subjects; average age of 17-18 years, of different racial backgrounds from 8 different higher secondary schools.
vi) Learners conduct Bengali/English as an pedagogic medium.

OPERATIONAL DIFINATION OF EMERGENT TERMS IN THE STUDY:

Teaching Mathematics: Researchers in mathematics education are primarily idea with the tools, methods and approaches that facilitate drill or the perusal of drill; however, mathematics education research conversant on the virtuous of Europe as the deontology of pedagogy of mathematics has raised into an oblong field of study, with its radical concepts, theories, methods, national and international organisations, conferences and literature. This article constructs some of the history, impression and instant discussion.

CAI: An individual-learning strategies concerning interaction of the student with programmed instructional materials. Computer-assisted instruction (CAI) is an interactive pedagogical strategy whereby a computer is conduct to present the pedagogical material and monitor the learning that carry place. CAI conducts a summation of text, graphics, sound and video in promoting the learning process. The computer has many purposes in the classroom, and it can be utilized to help a student in all areas of the curriculum.CAI put in to the conduct

of the computer as a tool to facilitate and enhance instruction. CAI programs conduct tutorials, drill and simulation, and problem solving approaches to present topic, and they test the student's understanding.

Traditional Method: Traditional method of teaching is when a teacher discernible students to acquire through memorization and recital techniques thereby not constructing their ticklish concern problem solving and decision making efficiency while modern or constructivist pathway to teaching comprise a more interacting, student-based of teaching. Here, the students acquire through group sharing.

METHODOLOGY OF THE STUDY:

In the procedure of research, methodology enumerated as an emergent field. It constructs the different sequence of the figure to be obtained in solving a research problem.

DESIGN OF THE STUDY:

The research is **true- experimental** in nature because the equilibrium of the control and experimental groups are gave by random assignment of topic to experimental and control interference. The research design imitated by researcher is the Pre-test – Post test Equivalent groups Deign.

POPULATION AND SAMPLE:

Population: The researchers will recherché the Murshidabad District of West Bengal for ambit survey. Researchers will recherché the ambit because it is easy to access to collect data for the research. The investigator will ascertain to accumulate data from Bengali medium school affiliated by W.B.C.H.S.E only. Researcher will also recherché four urban and four rural schools generally situated in Murshidabad District.

Sample: The researcher will recherché the students of class 11^{th} standard only who studies Mathematics in Science/Arts stream. The total number of sample will be 120. For the excerpt of sample he will succeed the cluster sampling technique. The sample was partitioned into two groups namely Experimental and Control group. The experimental group was taught determinants and matrix of Mathematics curriculum by computer assisted instruction and the control group was taught the similar part by traditional method of teaching. The independent variable is the way of instruction, and the dependent variable will be the acquirements of students as measured by the post test.

SAMPLING PROCEDURE:

The investigator will take out the data from Bengali medium school affiliated to W.B.C.H.S.E. To select school he will conduct the simple stratified sampling technique.

TOOLS:

The investigator created an achievement test in Mathematics on the topic of determinants and matrix. The achievement test containing 30 multiple choice question (MCQ) type items was created and pilot tested. Item analysis was done by measuring the difficulty level and discrimination index. Difficulty level from 0.5 to 0.7 and discrimination index from 0.35 to 0.50 was deliberated the adequate. The reliability was put in by the split half method and the reliability coefficient was put in to be 0.81, which were, delimitate the reliability of the tool. The final form of the scale bearing 25 items was conducted as an achievement test. The same test was conducted in pre-test as well as in post-test.

DEVELOPMENT OF CAI TOOL:

The contents were done from the 11^{th} standard of state board on Mathematics. The computer assisted instruction materials were constructed by parting the whole subject matter into various tasks, which were inhabited in the form of Microsoft power point. Question was also there to test the realizing and learning of the students. Appropriate background, colouring and pictures were conveyed to take the instruction more interesting.

DATA COLLECTION PROCEDURE:

In order to avoid the inter radical and intra radical variation of two different teachers for CAI and Traditional Instruction groups, it is appoint to use the both classes by a single teacher having a efficiency to use both CAI and traditional instructions side by side on the same dates. The CAI format lessons were initiated on the hard disks of the personal computers. A recherché room with desks, chairs, paper, clock, and a white board was conduct for the traditional instruction. The experimental group was expounded to CAI and the control group was stated by the traditional method of teaching.

DATA COLLECTION:

Data Collection at the closing of teaching by CAI and by traditional method, a post-test was observed to all the students of both groups. Data were collected from both the groups by offering them a test remained of 25 items, which will focus the performance of students.

HYPOTHESIS TESTING

Statistical techniques distribute the indispensable aim of the statement and inferential test. Culled data are resolved in terms of mean scores and standard deviation. To find the significance of the difference between pre and post-test scores t-test was conducted. The results accepted in the experiment were tabulated and have been submitted in the form of table and investigated below.

Hypothesis-1:

H_{01}: There is no significant difference between the mean scores connected to achievement of pre test of experimental and control group

Table 1: **Significant difference between the mean scores connected to achievement of pre test of experimental and control group**

Group	N	Mean	S.D.	t-value	Remark
Experimental	60	12.13	1.75	1.75	Not significant
Control	60	12.71	2.02		

Analysis: The above table reveals that the mean achievement score in the pre test are 12.13 and 12.71 for experimental and control group respectively. The 't' value is 1.75, which is not significant at the both level.

Interpretation: Hence it can be terminated that there is no significant difference between experimental and control group in the pre-test achievement. Both the group has closely the equivalent score in the pre-test. Hence, the first null hypothesis has been accepted means null hypothesis was accepted and this is still of present relevance.

Hypothesis-2:

H_{02} : There is no significant difference between the mean scores connected to achievement of pre test and post test of the control group

Table 2: Significant difference between the mean scores connected to Achievement of pre test and post test of the control group

Group	N	Mean	S.D.	t-value	Remark
Pre-test	60	12.71	2.02	0.33	Not significant
Post-test	60	12.57	2.57		

Analysis: The above table parade that the mean scores acquired by control group in pre and post test are 12.71 and 12.57 respectively. The t-value is computed as 0.33, which is not significant at both the level of significance.

Interpretation: Control group has emerged no significant change in their achievement scores in pre and post-test. Hence, the second hypothesis is accepted.

Hypothesis-3:

H_{03} : There is no significant difference between the pre test and post test gain scores of achievement of the experimental group.

Table 3: Significant difference between the pre test and post test gain scores of achievement of the experimental group

Group	N	Mean	S.D.	t-value	Remark
Pre-test	60	12.13	1.75	15.27**	** Significant at 0.01 level
Post-test	60	18.39	2.65		

Analysis: The above table displays that the mean scores acquired by experimental group in pre and post-test are 12.13 and 18.39 respectively. The t-value is 15.27, which is statistically significant at 0.01 level of significance.

Interpretation: Hence, it can be unimpeded concluded that experimental group has accomplished significantly higher score in the post-test. This evidently parades the positive impact of CAI on achievement of students. Hence, the third null hypothesis has been rejected means null hypothesis was rejected and this is still of present relevance.

Hypothesis-4:

H_{04} : There is no significant difference between the post test scores of achievement of control group and experimental group

Table 4: Significant difference between the post test scores of achievement of control group and experimental group

Group	N	Mean	S.D.	t-value	Remark
Experimental	60	18.39	2.65	12.38**	**Significant
Control	60	12.57	2.57		at 0.01 level

Analysis: The table displays the mean scores of the experimental and control group are 18.39 and 12.57 respectively in the post test. The t-value is 12.38, which is significant at 0.01 levels.

Interpretation: Hence it is illustrate that the experimental and control group differ significantly in the post test and the difference is in favour of experimental group. Perfection is evident that the students who are taught by the computer-assisted instruction learned more and so higher achievement is adopted than the traditional method of teaching. This is due to the favourable influence of CAI on achievement of the students. Hence, the fourth null hypothesis has been rejected means null hypothesis was rejected and this is still of present relevance**.**

RESULTS AND FINDING:

The following findings are acquired from the study-

1. The outcome of present study discloses that both the experimental and control group has nearly the similar score in the pre-test.

2. The outcome of the present study clearly point out the significant enhancement in the mean scores that has been constructed in the post-test scores of the experimental group.

3. Significant differences have been constructed between the control and experimental group on post-test scores.

4. The experimental group, which was indoctrinated by CAI, displayed better learning.

5. It is obvious that the CAI is an efficient media of instruction of teaching mathematics than traditional method at higher secondary level.

CONCLUSION

This paper has specially accentuated on computer literacy. The entry of computers in the classroom has changed the entire present scenario. The computer is now expected on as the super teaching machine. Its conduct in education has been tried as originality and it has confirmed its teaching efficiency in different subject areas. The present study has consecrated that CAI significantly enhances the performance and learning achievements of students in mathematics. In present scenario, the computer education has been raised at the school level. The teacher should conduct computer as a medium of instruction in classroom. CAI can be prepared to be dedicated in large classroom as it provides for maximum amount variety and flexibility by maintaining the quality and quantity of education.

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