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EFFECTIVENESS OF COMPUTER TECHNOLOGY AND MEASURES OF VARIABILITY TO STUDENTS EDUCATORS

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Abstract

This papers is deals with the use of computer technology for students educators in Pune. Education is a never ending process and powerful tool which brings dynamic changes in society as well as among the learner. Education inculcates values, morals of our culture from one generation to next generation. It helps to bring up new changes as per the need of societies and learners. Statistics is widely used subject in each and every sector of life such as in newspapers, public health centers, sports to maintain current score and records, in education sector it is used to maintain progress records, to decide the rank of students, etc The main objectives of the study are i) To prepare an achievement test on Quartile Deviation (Q.D) and Standard Deviation (S.D). ii) To develop CAI programme for Quartile Deviation (Q.D) and Standard Deviation (S.D). iii) To find out the effectiveness of CAI programme. iv) To find out the reactions of student educators towards the developed CAI programme.

The findings of the study are 1) Computer Assisted Instruction (CAI) method is superior to the Conventional method. 2) Responses of the students, towards developed CAI programme is found very positive and from above findings it concludes that, 1. Computer Assisted Instruction method is proved very effective and students can learn with their own pace and time. 2. Responses of the students towards prepared CAI programme is found very positive

Keywords: Computer Technology, Measures of Variability, Students Educators

Background of the Study

Education is a never ending process and powerful tool which brings dynamic changes in society as well as among the learner. Education inculcates values, morals of our culture from one generation to next generation. It helps to bring up new changes as per the need of societies and learners. In this globalized world there are three types of explosions have been

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observed, population explosion, information explosion, and knowledge explosion. In this circumstances computer plays a vital role, it allows to mediate the flow of information to the learner. Hence in each and every sector of life computer and technology has proved its efficiency even though education sector is also not excluded from it. In Education sector it is used in the form of programme based learning (PBL), computer based learning (CBL), computer aided learning (CAL), and computer assisted instruction (CAI). All these forms of computer brings a homogeneous and creative atmosphere in class rooms and meet individual needs of the learner and brings equity and quality in education.

Statistics is widely used subject in each and every sector of life such as in news papers, public health centers, sports to maintain current score and records, in education sector it is used to maintain progress records, to decide the rank of students, etc. Statistics is a branch which helps us to in the scientific collection, presentation, analysis and interpretation of numerical facts. Statistics plays a major role in drawing the general conclusions and making predications on the basis of particulars facts and evidences.

Rational of the Study

The term statistics is derived from the word state, was used to refer; to a collection of facts of interests to the state. In day today's life the term statistics is more commonly used everywhere. Descriptive statistics are featured in every newspaper and magazine, sport magazine, public health center administrator keeps the records of patients and type of illness.

Statistics and its methods are most frequently used in the field of education and Psychology also. Researcher and teacher may utilize statistics in following manner.

- To know and identify the individual differences among the students.
- ✤ To know the presence of heterogeneous group in the class-room.
- To rendering appropriate guidance and statistical techniques.
- ✤ To provide an effective and suitable, creative learning climate to the class-room.
- To provide own pace for learning.
- To provide ample scope for self learning at their own pace.
- It also helps various types of records.
- It also helps to predicts future progress of the students.

Guilford (1973) has summarized the advantages of statistical thinking and operations in research. According to him they are..

- Enable students to draw general conclusions.
- Enable students to predict and analyze.
- Enable to us summarize our results in a meaningful and in a convenient form.

Significance of the Study

Statistics is one of the most important subject; not only in Education field, but also in each and every field. In education field, Statistics and its methods are useful for the teacher and research students. Regarding its wide application in the field of education, psychology, and each and every sector of life; students should know the proper use of statistics and its widely applicable methods. It provides actual and exact kind of data, information. Now a day's students think, that statistics is a complicated subject; but this is not the fact. Statistics is very interesting and joyful subject but one should know the proper use of statistics and its widely applicable methods. By taking this point into consideration investigator decided to investigate; '*Effectiveness of Computer Technology for Measures of Variability*.' This study can be made easy by computer and technology. Computer and technology are one of the most important technological tool in the hands of teachers, by which teacher can give their learning experiences in better and an effective way than regular methods of teaching. In Computer Assisted Instruction programme students can learn with their own speed and time and give active respond to the system.

Due to this, reason investigator has decided to conduct research study entitled, *Effectiveness of Computer Technology for Measures of Variability to students educators.*'

Statement of the Problem: Effectiveness of Computer Technology and measures of variability to teach student educators.

Objectives of the study: The study envisages the following objectives.

- i) To prepare an achievement test on Quartile Deviation (Q.D) and Standard Deviation (S.D).
- ii) To develop CAI programme for Quartile Deviation (Q.D) and Standard Deviation (S.D).
- iii) To find out the effectiveness of CAI programme.

iv) To find out the reactions of student educators towards the developed CAI programme.

Operational Definition

- a) Measures of Variability: A sub units standard deviation and quartile deviation which are included in M. Ed. degree course curriculum.
- **b) Computer Technology:** It refers with Computer Assisted Instruction programme is prepared for statistics subjects with the help of Microsoft power point.
- c) Effectiveness: A Significant difference between means score of pre-test and post-test.

Conceptual Definition

a) Measures of Variability: A variability which define the degree of Variability or dispersion by the use of single number and tells how the individual scores are scattered or dispersed throughout the distribution. **b) CAI:** CAI is the use of a computer as a medium of Instruction for Tutorial, drill and practice, simulation or games, CAI is used for both initial and remedial training and typically does not require that a computer be connected to a network or provide links to learning resources outsides of the course.

Assumptions of the Study

i) M. Ed students can learn statistics effectively with the help of CAI Programme.

ii) M. Ed. Students would posses positive response towards CAI programme

Delimitation of the Study: The following Delimitations determine the boundaries of the study.

I) This programme includes CAI programme for statistics.

II) This programme limited to study only Quartile deviation.

III) This programme is prepared for M. Ed students of year 2018-2019.

IV) This CAI programme includes power point presentation of only statistics function Q.D.

V) This programme is limited to Pune University affiliated colleges.

Limitation of the Study: The recognized limitations of this study are as below:-

- 1) The technical aspects like electricity, computer hanging, software running, and other technical problems regarding computer are beyond the control of the researcher.
- 2) The Psychological aspects like motivation, interest, and attention of the students are beyond the control of the researcher.
- 3) The impact of educational aspects like private coaching classes, multimedia, and available software in market are beyond the control of the researcher

Hypothesis of the study

a) Research Hypotheses

1. There is a significant difference between mean score of students

taught by conventional methods and CAI method.

2. Difference existing between the observed and expected frequencies.

b) Null Hypotheses: In order to realize the objectives of the study, the following hypothesis are formulated for testing.

H0: There is no significant difference between mean scores of students taught by conventional methods and CAI method.

H0-1: No difference existing between the observed and expected frequencies.

Research Design: Research design of this study consist of experimental method with single group design.

 $O_1 X O_2$

Pre- test O_2 = Post-test (*Best & Khan 2006. Page 173*) $O_1 =$

Sampling Method: Present research study consists of incidental sampling method. As it is an experimental study the investigator delimited the area. Therefore the student educators are selected as the research samples. The researcher selected randomly 37 students out of 50 student educators from M. Ed. Class.

Sr. No	Design	Experimental/Control group	Total
1	Single Group	37	37

TABLE	2 1: Sa	mple	of t	he st	udy	
	1			10		

Statistical Techniques Used for study: The following statistical techniques will be employed for the analysis of data collection.

1. Mean $\mathbf{M} = \sum fx / N....(Garret H. E. 2008 Page No. 29)$ S.D. $\sigma = \sqrt{\sum X^2/N - C^2} \dots (Garret \ H. \ E. \ 2008 \ Page \ No. \ 52)$ 3. t – test $t = (M1 - M2) / SED \dots (Garret H. E. 2008 Page No. 224)$ 4. Chi-Square test $X^{2} = \sum [(fo - fe)^{2} / fe)]...(Garret H. E. 2008 Page No. 252)$

Tools for Data Collection: The following tools were used to collect the data.

a) CAI programme: The Computer Assisted Instruction programme is developed in Microsoft PowerPoint. CAI programme was developed by investigator for Standard Deviation, Quartile Deviation. Programme consists of 37 slides, which are further divided for Quartile deviation, standard deviation. 4 slides for previous knowledge. 5 slides are based on primary section, meaning, concept, types, and importance of measures of variability. Furthermore 20 slides based on problems of standard deviation, Quartile Deviation, and 8 slides for exercise respectively. The developed programme is absolutely user friendly in nature.

b) Achievement Test: An Achievement test (pre-test and post-test) is prepared by researcher based on the M. Ed. curriculum for standard deviation, Quartile Deviation is administered, evaluated, and analyzed.

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C) Reaction Scale for Student Educators: The reaction scale for student educators was prepared by researcher; in order to find out the reactions of the student teacher Educator, for developed CAI programme. The reaction scale was administered, evaluated, and analyzed.

Analysis of Data for Testing Null Hypothesis: The data obtained from post-test of the experimental group was analyzed by using appropriate statistical tools and techniques like Mean, S.D., t- test and 'Chi Square test. For this, the score of post test were considered.

							Calcul	Observe
Group	Test	Ν	Μ	S. D	r	df	ated 't'	't'
								0.01
	Pre	37	6.43	2.46		_		
Single	Post	37	14.17	2.34	0.28	36	16.28*	2.72

TABLE: 2: Mean, S.D. and 't' value for Single Group

* Significance at 0.01 level.

Graphical Representation of Pre- Test & Post-Test



Observations and Interpretation

- Table No. 2 shows the mean of marks obtained by, 37 student teacher Educator (M.Ed. students) of control group; as well as experimental group. This table also shows standard deviation, Coefficient of correlation and calculated 't' value at 0.01 significance level.
- The calculated 't' value is 16.82 exceeds than observed 't' table value at both 0.01 significance level respectively.
- Hence it is taken to be significant resulting in the rejection of null hypothesis H0: and accepting the research hypothesis.

Category	Student	Calculated \mathcal{X}^2 Value
Medium	03	
Good	16	29.42*
Best	18	

TABLE: 3: Interpretation of data for Chi Square Test

* Significant at 0.05 and 0.01 Significance level.

Graphical Representation of Chi Square Test



Observations and Interpretation

- Table 3 shows the reaction of the 37 M.Ed. students; about developed CAI programme for statistics, it shows calculated 'Chi' Square value; based on the hypothesis of normal distribution at 0.01 significance level
- The calculated 'Chi' Square value is 29.42 which is exceed than observed 'Chi' Square table value at 0.01 significance level.
- Hence it is taken to be significant resulting in rejection of the null hypothesis H1: and accepting the research hypothesis.

Findings

- 1) Computer Assisted Instruction (CAI) method is superior to the Conventional method.
- 2) Responses of the students, towards developed CAI programme is found very positive.

Conclusion: From above findings it concludes that,

- 1. Computer Assisted Instruction method is proved very effective and students can learn with their own pace and time.
- 2. Responses of the students towards prepared CAI programme is found very positive.

Educational Implication

- Computer Assisted Instruction teaching method is effective; for the proper understanding of statistical concepts.
- ✤ It provides an opportunity for a teacher to a create conducive atmosphere in classroom.
- It helps to create self esteem among the learner.
- It promotes to learn critical concepts in small steps.
- Students learn with their own pace and time.
- Role of teacher in case of CAI is an instructor.
- CAI helps the students in construction of knowledge means it follows the psychological Theory of the Piaget's Cognitive Constructivism.

Discussions of Results

- 1) Computer Assisted Instruction (CAI) method is superior to the Conventional method.
- 2) Responses of the students, towards developed CAI programme is found very positive.

The above findings of the studies are supported by following findings and discussion: **1) Kadhiravan, S. (1999).** *Effectiveness of Computer Assisted Instruction in Relation to Students Use of Self-regulated Learning Strategies.* In this research studies three instructional strategies, LM, CAI, CAIPI are discussed and CAIPI found most effective one in terms of its effectiveness in realizing the instructional objectives in the context of contents with low difficulty level.

In the present research study it is observed that the developed (CAI) Programme for Statistics subject for student teacher educator was found significantly superior to control group. In present research study only one CAI strategies is used.

2) Shanathi, S and Amal, R.A. (2002).*Computer Assisted Instruction on Achievement in Science in School.* Indian Educational Abstract. 115. The findings of the study were i) the students taught through CAI showed significant difference in the attainment of the learning objectives pertaining to the realm of Knowledge, Application, and Skill where as result showed similar effect on understanding among control and experimental group. ii) Significant effect was observed on the achievement in favour of CAI in all aspects of learning. iii) CAI students scored significantly higher marks over the control group students.

In the present research study it is observed that the developed (CAI) Programme for Statistics subject for student teacher educator was found significantly superior to control group. The above mentioned research study conducted for Science subject in School where as this research study conducted for Statistics subject for student teacher educator **3) Ponraj P., Shivkumar R. (2010 Feb.).** *Computer-Assisted Instruction in Zoology in Relation to Learner's Personality.* EDUTRACKS. Page (35-37). Findings of the study are that Experimental Method of teaching is more effective than the Traditional Method in teaching Zoology.

In the present research study it is observed that the developed (CAI) Programme for Statistics subject for student teacher educator was found significantly superior to control group. The above mentioned research is conducted for zoology where as present research study was conducted for Statistics subject. Both research studies shows effectiveness in favour of CAI.

4) Jyothi, K.B.S. (2007 April). *Impact of Computer-based learning on students of Chemistry*. EDUTRACKS, 26-29. Findings of the study were; i) The study clearly revealed that the self-instructional module prepared by a teacher through a power point presentation could showed immense impact on learning of chemistry. ii) Students are better motivated and interestingly participated in the Computer based learning.

In the present research study it is observed that the developed (CAI) Programme for Statistics subject for student teacher educator was found significantly superior to control group. The above mentioned research and present research is conducted for Statistics subject.

5) Pondhe, M. S., (Eds.). (2007 Feb). *Effectiveness of CAI Method in Teaching Mathematics to the VII Standard.* The Findings of the study were; i) The difference in mean between the controlled and experimental group was not statistically significant for both the units. ii) Taken collectively all these conclusions, the traditional and CAI methods were equally effective teaching methods of mathematics for the VII standard.

In the present research study it is observed that the developed (CAI) Programme for Statistics subject for student teacher educator was found significantly superior to control group. The above mentioned research and present research is conducted for Mathematics subject. The developed CAI programme is effective in case of Quartile Deviation (Q.D) and Standard Deviation (S.D) for student teacher educator.

REFERENCES

Books:

Bagulia, Abdul, Mannan. (2005). *Modern Education: Audio-Visual Aids*. New Delhi: Anmol Publication Pvt. Ltd.

Bhattacharya, S.K., (2006). Educational Technology, New Delhi: Abhishek Publication

- Best, J.W., and Kahan, J.V. (2005). *Research In Education*. New Delhi: Prentice Hall of India.
- Garrett, H. E. and Woodworth, R. S. (1981). *Statistics in Psychology and Education*. Bombay: Vakils, Feffer and Simons Ltd.
- Gay, L. R. (1996). *Educational Competencies for Analysis & Application*. New Jersey: Merril Prientice Hall.
- George, Argyrous. (2005). Statistics for Research. New Delhi: Sage Publication.
- Mangal, S. K. (2005). *Statistics In Psychology and Education*. New Delhi: Prentice Hall of India.
- Mahapatra, B. C. (Eds.). (2006). *Education in Cybernetic Age*. New Delhi: Sarup & Sons.
- Robert, Heinch, & Others. (1986). Instruction Media and New Technologies of Instructions Computer. New York: Macmillan Publishing Company.
- Sheldon, M. Ross. (2006). Introductory Statistics. London: Academic Press.

William, W. and Stephen, G. J. (2005). *Research Methods in Education*. U. S. A.: Pearson. **Report:**

(2007). National Knowledge Commission, Report to the Nation, New Delhi: Govt. Of India.