"Status of Computer assisted instruction (CAI) and Information and Communication Technology (ICT) learning among senior secondary school students of Government and Non-Government Schools."

Ms. Sushma Rani [a]

Abstract

In today's information age, computers are being used in every walk of life. They are being used by people of all ages and profession in their work and in their leisure. This new social revolution has changed the basic concept of 'Computing'. Computing in today's information age is no more limited to computer programmers and computer engineers. Even those who need to program a computer can do their job more effectively with a better understanding of how computers function and the capabilities and limitations of computers. As a result, almost all academic institutions have started offering regular courses on foundations of computing at all levels. These courses deal with the fundamental concepts of the organization, functions and usage of modern computer systems. The field of CAI and ICT is inherently multidisciplinary. It applies research from the fields of second language acquisition, sociology, linguistics, psychology, cognitive science, cultural studies, and natural language processing to second language pedagogy, and it melds these disciplines with technology-related fields such as computer science, artificial intelligence, and media / communication studies.

This present study presents the research to be undertaken to document the process of study the status of CAI and ICT learning among senior secondary students of Government and Non-Government schools of Ambala Cantt. It analyses the aspects that educators should pay attention to when designing a curriculum for ICT (Information and Communication Technology) and Internet based learning in senior secondary schools.

Thus, it presents the multiplicities and changeability in the field of CAI & ICT based-learning, which include the emergence of new theoretical, methodological and learning paradigms, special understanding and expertise required to assess the quality and depth of educational practices.

Keywords: ICT, Government and Non-Government schools,Information And Communication Technology, CAI

[a] **Ms. Sushma Rani**
Research Scholar,
Department of Education,
Banasthali Vidyapeeth, Jaipur, Rajashtan, India.
Email : sushmatitoria@gmail.com
Ph: +91 9467921423

1. Introduction

Today, CAI and ICT activities exploit improved technology to produce highly interactive learning environments, providing effective support for the acquisition of listening, speaking, reading, and writing skills. High-speed networks allow access to authentic cultural materials and link learners to speakers around the world. When integrated into a pedagogical plan, these new technologies enhance learning opportunities beyond anything previously possible. CAI and ICT researchers explore and evaluate these new instructional options to establish how they can best integrate them into effective

pedagogy. Computer- Assisted Language (CAL) and Information And Communication Technology (ICT) learning is a relatively new and rapidly evolving academic field that explores the role of Information and Communication Technologies in language learning and teaching. It provides fertile ground for leading edge, innovative, and highly creative thinking and scholarly work. Because of the multiplicities and changeability of the field, which include the emergence of new theoretical, methodological, and learning paradigms, special understanding and expertise is required to assess the quality and depth of such scholarly activities.

This present study presents the research to be undertaken to document the process of study the status of CAI and ICT learning among senior secondary students of Government and Non-Government schools of Ambala Cantt. It analyses the aspects that educators should pay attention to when designing a curriculum for ICT (Information and Communication Technology) and Internet based learning in senior secondary schools.

1.1.   **CAI AND ICT:** When computers will be used in education, they will be more than just another medium of teaching, such as a chalkboard. The integration of computers changes the whole ecology of a school, for example, finding teaching methodology, evaluation, curricula and timetable. Interpreting the computer in education means using the power and ability of the computer to aid learning in every subject area within the school.
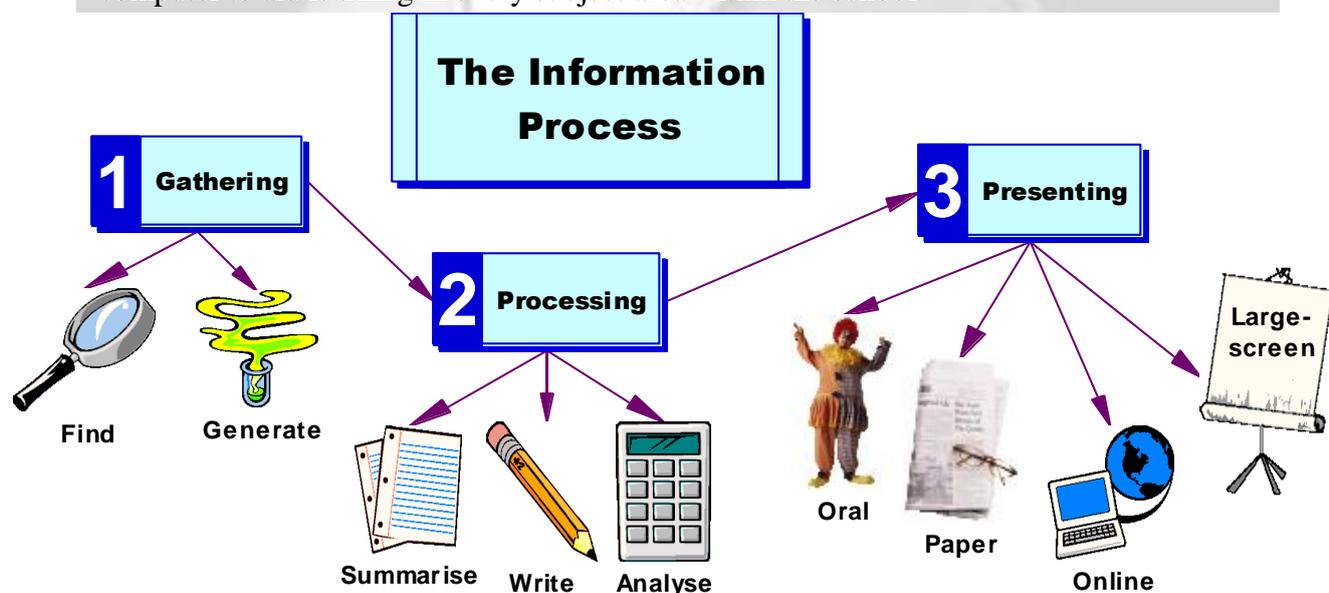
Information Processing   Fig. (1.1)

1.2.   Operational definitions of information to be used

CAI (Computer Assisted Instruction) Computer–assisted instruction (CAI) is a narrower term and most often refers to drill-and-practice, tutorial, or simulation activities offered either by themselves or as supplements to traditional, teacher directed instruction. The status of Computer Assisted Instruction (CAI) in present survey is studied by the questionnaire developed by the instructor.

ICT (Information And Communication Technology): The Technology resulting from the increasing convergence and integration of computing, electronics and telecommunication, allowing the exchange of messages by telephone (fixed or mobile) - e-mail, access to information, public debate on several issues through the Internet, TV, Radio, video conferencing, the delivery of homes of high speed broadband services. The combination of Information Technology with other related technologies

specifically communication technology. The status of Information And Communication Technology (ICT) learning in present survey is studied by questionnaire developed by the instructor.

Senior Secondary Students : Those students who are studying in 10+1 to 10+2 level in a recognized school are senior secondary students.

Government And Non-Government Schools: The schools, which are run by the Government, are called as Government schools while the schools, which are recognized by the Government but are run by some other body are known as Non-Government schools.

1.3.   Need and significance of study

The significance of the problem selection is the rationale for a study. It tells the reader why the study is important and indicates the reasons for the researcher's choice of a particular problem. We undertake the study, as we want to study the status of students among Computer Assisted Instructions (CAI) and Information and Communication Technology (ICT) whether it is satisfactory. To know the satisfaction we want to carry out a survey. The main aims of research proposal are: -

i)   To extend the understanding of the global phenomenon of using CAI, ICT and Internet based learning in Secondary schools.

ii)   To provide knowledge about the use of CAI and ICT-based learning activities in Secondary school.

iii)   To contribute to the formal use of ICT and Internet-based learning in Secondary School, through description of aspects that challenges educations in curriculum development for ICT and Internet-based learning.

2. Review of literature

Chander S. Panda and Chaudhary JayaKrushna (2000) studied the defect of Computer Assisted Learning (CAL) in achieving higher Cognitive skills and clearly indicates the superiority of CAL over traditional approaches. Moreover the use of interaction approach in CAL is supposed to contribute to the over and above effectiveness of CAL. The effect of gender on learning outcome in physics in the face of it indicates its level of significance only at 0.05 levels but not at 0.01 levels.

Dubey and Adhikari (1999) studied the effectiveness of CAI in terms of achievement of students its comparison with traditional method and found that the CAI material to be effective in terms of achievement of students and superior to the traditional method when intelligence was taken as covariate**.**

Kadhiravan and Suresh (1999) investigated the effect of different instructional techniques viz. Lecture method, CAI and CAIPI in enhancing the students' use of self regulated learning strategies and found CAIPI to be the most effective technique in enhancing the use of self regulated learning strategies among the students.

Kearsley, (1992). It involved changes in a school. The entire school community of students, parents, teachers and administration has to accept that computer area as part of everyday school life.

Lippert, (1993). The integration of computers changes the whole ecology of a school, for example friendly teaching methodology, education curricula and timetables.

Mecklenburge, (1989). In order to integrate technology, schools have to exploit that technology for the betterment of the school and their students form a part of that technology.

Morison, (1989). The impact of the computer depends on the developmental level of the school in respect of computers.

Raymond Roger Spaulding (1984) Conducted research to evaluate the quality of learning (achievement, productivity, at-task, behaviour and attitude) in learning programme classes in the junior high school using a classs-room arrangement of student grouping known as the 'pod concept'. The study endeavored to answer these questions.

Do students learn more, produce more, stay at-task more, and has a more positive attitude when working at the computer in groups of three or working in pairs or individually at the computer? The results of the study indicated that no significant difference existed in achievement student at task behaviour and student attitude between students working at the computer in triads and those working at the computer in pairs or individually. A significant difference in the 0.5 levels was found in student productively between students grouped on the computers in triads and students grouped in pairs.

It was concluded from the data of this study that students grouped in triads at a task well display a positive attitude towards computers as students grouped in pairs or individually. In the area of productivity, students working in triads excelled our students working in pair in the amount of computer programming completed.

The results of this study implied that the use of students grouped in triads at the computer has the potential to provide computer instructions for more students, at a reduced cost and without sacrifice of student learning.

Rai (1999) compared the academic achievement of students in grade six to twelve, who received other traditional instruction supplemented with CAI and found that the average students exposed to CAI showed academic achievement was greater than of 58.2% of those students who were exposed to traditional instruction.

Reddy and Ramar (1999) undertook two objectives to study.

- To develop software for CAI to teach science to slow learners.
- To measure the effectiveness of CAI with special reference to slow learners and conducted that the CAI was more effective than the traditional lecture method in teaching science and it enabled the slow learners to cope with normal students to a considerable extent.

Sayre Smith (1984) in a case study of the management process of increased computer usage was conducted in a public school district, which experienced a rapid growth rate of computers and the development of a computer literacy program during the 1982-83 school year. The first major conclusion from the study is that the Gobson and Nolan findings of the expansion stage of computer growth from the business modes are generalizable to the growth of systems activity and computer usage in the public system. Problems involving the location of computers, fear of computers, changing of jobs roles employee resistance, rise in expenditure for hardware, software and rapid expansion of computer applications can be expected.

The second conclusion is that the Kalz & Kahn findings can be applied to computer applications in a public school system. This was supported by examining the increase in computer activity and organizational effects in the areas of communication, personnel, budget and decision-making.

A third conclusion restricted to case is that a sharp and dramatic increase of computer usage in the school system was evident in the areas of instruction when a computer literacy program was introduced. A recommendation from the study was that the management of computer growth in a public school system should be systematically planned and gradually implemented.

Sunil Kumar, (2003). A comparative study of the effectiveness of technology aided learning and conventional methodology on the student's academic achievement.

William Robert Feuny (1984) did research on "concordance of micro-computer uses in Education". The purpose of this study was to determine if administrators, teachers using computers-teachers not using computer

experts and banks showed agreement when ranking the salient elements of a computer education program, the curricular uses of microcomputers. Bases on a review of the literature and input from a selected panel of nine recognized experts in the field of educational computing, the "Microcomputer Salient Element Identification Instrument" was developed. Several conclusions were drawn:

- Overall computer literacy was ranked as the most educational goal and in servicing teachers.
- The computer experts however, ranked "using the computer as a problem solving tool " as most important.
- "Keyboard familiarization" was ranked as the most important curricular use with application, software programming and world processing following in order. The computer experts ranked keyboard familiarization in a tie with word processing. The computer using teachers rated basic programming as most important.

Overall the most important administrative use students record keeping and grade reporting, financial accounting and reporting was rated second, payroll and student   scheduling tied for third and fourth. The computer experts ranked word processing as the most important administrative use of microcomputers.

3. Objectives of the study

1) To study the status of Information and Communication Technology (ICT) learning among senior secondary students of Government and Non-Government schools.
2) To study the status of Computer Assisted Instruction (CAI) learning among senior secondary students of Government and Non-Government schools.
3) To compare the status of Information and Communication Technology (ICT) learning among students of Government and Non-Government schools.
4) To compare the status of Computer Assisted Instruction (CAI) learning among students of Government and Non-Government schools.

4. Hypotheses of the study

The following hypotheses were to be made by the integration in relation to the study: -

Research hypothesIs

i) Information and Communication Technology (ICT) learning among senior Secondary students of Non-Government school is better than that of Government schools.
ii) Computer Assisted Instructions (CAI) learning among senior secondary students of Non-Government schools is better than that of Government schools.

Null Hypothesis

i) There is no significant difference between the status of Information and Communication Technology (ICT) learning among students of senior secondary students of Government and Non-Government schools.
ii) There is no significant difference between the status of Computer Assisted Instruction (CAI) learning among students of senior secondary students of Government and Non-Government schools.

5. Delimitations of the study

The study was delimited to 160 students of senior secondary students of Government and Non-Government schools of Ambala Cantt. It was confined to the suggestions of student's only.

6. Research Methodology

The methodology is mainly divided into the following main headings, which are detailed hereunder:

Research design

A descriptive approach that is mostly of theoretical nature would be of Purposive sample schools and then measure the effects as to how the instructions and technologies should be used in such schools. The research design is based on the descriptive research and survey. The present study is a Descriptive Research, the purpose of which is to differentiate between Government and Non-Government schools in terms of status of Computer Assisted Instructions (CAI) and Information And Communication Technology (ICT) learning.

Sampling

A purposive sample of 160 students of XIth standard class was drawn from Government and Non-Government schools of Ambala Cantt (Haryana State).

It is difficult rather impossible to include population in any research project. Generally investigator selects a part of the whole population to draw the conclusions and make generalization about the whole population. Sampling is a process by which a relatively small number of individuals, objects or events are selected and analyzed.

In the present study purposively sampling were employed to select a representative sample. In this method each unit of population was given an equal chance of being selected. The selection of units from the population was done in such a manner that every unit in the population stands an equal chance of being chosen. A representative sample of 160 Senior Secondary Students were selected out of which 80 students of Government schools and 80 of Non-Government schools were included in the sample.

Sample of the present study

Sampling is indispensable technique of the studies. It is a process by which a relatively small number of individuals, objects or events are reflected and analyzed in order to find out something about the entire population from which it is selected.

The present study aimed *at* **"Status of Computer assisted instruction (CAI) and Information and Communication Technology (ICT) learning among senior secondary school students of Government and Non-Government Schools."**

Although, the present study is confined to 11th standard students only, but for this study investigator selected only four schools in which CAI and ICT learning has been implemented. For comparison, investigator selected four schools in which CAI and ICT learning are being used. The purposively sampling were used in the procedure

Since the present study aims at studying the status of CAI and ICT learning among senior secondary students of Government and Non- Government schools of Ambala Cantt.The Questionnaire includes both the closed as well as the open statements to study the status of CAI and ICT learning among senior secondary students of Government and Non-Government schools. The sample for the present study is as follows: -

The samples of 160 students were selected using, from both schools (80 from Government Schools and 80 from Non-Government Schools) of Ambala Cantt. The sample of 160 students of the XI class was collected from following schools of Ambala district. The names of the schools undertaken for survey are as follows: -

S.No.	Name of the Schools (CAI) and (ICT)- Government Schools.	No. of students
1.	Government Senior Secondary School, Ambala Cantt.	40
2.	Government Senior Secondary School, B.C. Bazar, Ambala Cantt.	40

Table No. (1)

S.No.	Name of the Schools (CAI) and (ICT)- Non-Government Schools.	No. of students
1.	Lord Mahavir Senior Secondary School, Ambala Cantt.	40
2.	Bharat Public School (B.P.S.), Ambala Cantt.	40

Table No. (2)

Research Tools:

The two research tools i.e. Computer Assisted Instructions (CAI) and Information and Communication Technology (ICT) developed by the investigator, were used to study the status in Government and Non-Government schools. The research was of a mixed qualitative and quantitative nature where quantitative data were used to support observations of each student by scores key while the qualitative survey is used to study the opinions of the individual students. The research instruments - namely the questionnaires were used to collect the information and the methods to be used to validate the findings of the research project. To study the status of Computer Assisted instruction (CAI) and Information and Communication Technology (ICT), the investigator had to prepare a result card in order to record the school marks of each student.

The following tools were used in the present study for collection of the data from the respondents: -

The two research tools i.e. Computer Assisted Instructions (CAI) and Information and Communication Technology (ICT) developed by the investigator, were used to study the status in Government and Non-Government Schools.

Interpretation of the Data:

After developing the tools, the investigator visited Senior Secondary Schools. Permission for administration of the Questionnaire was sought from the concerned Principals. At the time of administration of the questionnaire, the XIth standard students were first introduced to the topic and the purpose of the present study. All the students having a Computer Education and Information and Communication Technology as their teaching subjects present on that very day were made to sit at one place. The investigator gave clear instructions to them fro filling up the questionnaire. They were explaining the method of recording their responses on the questionnaire. The students were asked to freely ask and clarify any doubt in relation to the questionnaire.

TABLE (3)

Significance of difference between ICT scores obtained by students of government and non-government schools

Schools	N	Mean	SD	S.Ed	't-value'	Level of Significance
Government	80	17.25	8.213			Significant at 0.01 level
				1.194	3.2008	
Non-Government	80	21.08	6.84			

Where , degree of freedom is,

$$df = (N_1+N_2-2) = 158$$

The 't' test is used to find the significant difference between the CAI and ICT based Learning among Senior secondary students of Government and Non-Government Schools.

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\left(\frac{(N_1-1)S_1^2+(N_2-1)S_2^2}{N_1+N_2-2}\right)\left(\frac{1}{N_1}+\frac{1}{N_2}\right)}}$$

Where,

x_1 is the mean of first data set (Govt. School)

x_2 is the mean of first data set (Non-Govt School)

S_1^2 is the standard deviation of first data set (Govt. School)

S_2^2 is the standard deviation of first data set (Non-Govt School)

N_1 is the number of elements in the first data set (Govt. School)

N_2 is the number of elements in the first data set (Non-Govt School)

Interpretation

1.   Form Table (3), it is observed that status of ICT learning among senior secondary students of Government and Non-Government schools have mean scores of 17.25 and 21.08 respectively. Their SD's are 8.213 and 6.84 respectively. The calculated 't-value' between the status of ICT learning among senior secondary students of Government and Non-Government schools comes out to be 3.2008.The table value needed to be significant at 0.05 level is 1.960 and 0.01 level is 2.58 respectively. So, the calculated 't-value' is significant at 0.01 level.

2.   As there is a significant difference between status of ICT learning among senior secondary students of Government and Non-Government schools. So, Null hypothesis is rejected. It means there is a difference between the Status of ICT learning among senior secondary student of Government and Non-Government schools.

3.   Since, the mean score is found to better in Non-Government schools than in the Government schools .So, it is concluded that Non-Government schools have better ICT learning than the Government schools.

Table (4)

Significance of difference between CAI scores obtained by students of government and non-government schools

Schools	N	Mean	SD	S.Ed	't-value'	Level of Significance
Government	80	30.6	5.46	1.3912	8.273	Significant at 0.01 level
Non-Government	80	42.11	11.18			

Where , degree of freedom is,

df = (N₁+N₂-2) = 158

The 't' test is used to find the Significance of difference between CAI scores obtained by students of government and non-government schools

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\dfrac{(N_1-1)S_1^2 + (N_2-1)S_2^2}{N_1+N_2-2}\right)\left(\dfrac{1}{N_1} + \dfrac{1}{N_2}\right)}}$$

x_1 is the mean of first data set (Govt. School)

x_2 is the mean of first data set (Non-Govt School)

S_1^2 is the standard deviation of first data set (Govt. School)

S_2^2 is the standard deviation of first data set (Non-Govt School)

N_1 is the number of elements in the first data set (Govt. School)

N_2 is the number of elements in the first data set (Non-Govt School)

Interpretation

1. Form Table (4), it is observed that the status of CAI learning among senior secondary students of Government and Non-Government schools have mean scores of 30.6 and 11.18 respectively. Their SD's are 5.46 and 11.18 respectively. The calculated 't-value' between the status of CAI learning among senior secondary students of Government and Non-Government schools comes out to be 8.273.The table value needed to be significant at 0.05 level is 1.960 and 0.01 level is 2.58 respectively. So, the calculated 't-value' is significant at 0.01 level.

2. As there is a significant difference between the status of CAI learning among senior secondary students of Government and Non-Government schools, so Null hypothesis is rejected. It means there is a difference between the Status of CAI learning among senior secondary student of Government and Non-Government schools, since, the mean score is found to be better in Non-Government schools than in the Government schools .So, it is concluded that Non-Government schools have better CAI learning than the Government schools.

7. Findings

- The curve for ICT for Government schools were found to be Mesokurtic bimodel graph i.e. firstly, it follows the Positively skewed Mesokurtic curve and then Negatively skewed Mesokurtic curve, while it was Positively skewed Mesokurtic for Non-Government schools.

- The curve for CAI for Government schools were found to be Negatively skewed Mesokurtic, while for Non-Government schools, it was found to be Positively skewed Mesokurtic curve.
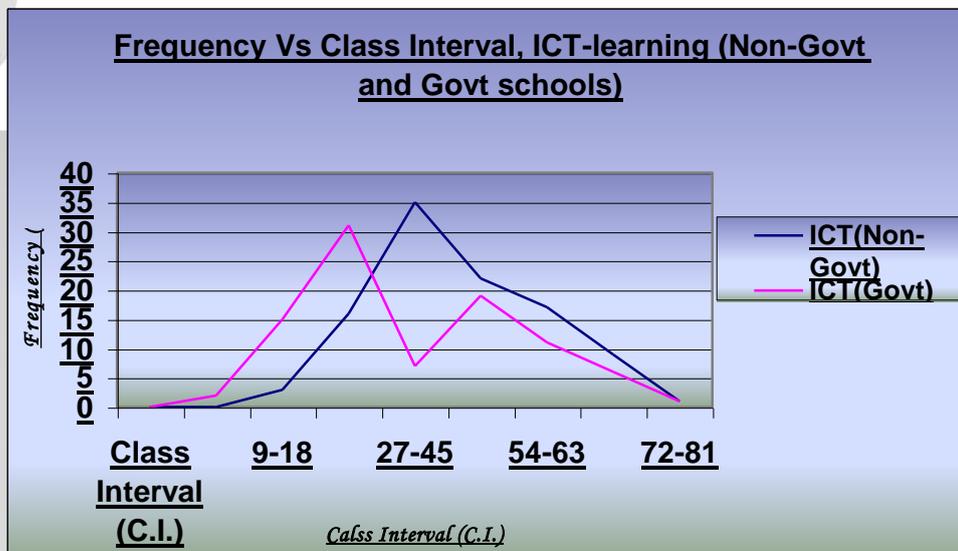
Graphical representation of ICT Learning among senior secondary students of Government and Non-Government Schools   **Fig. (i)**
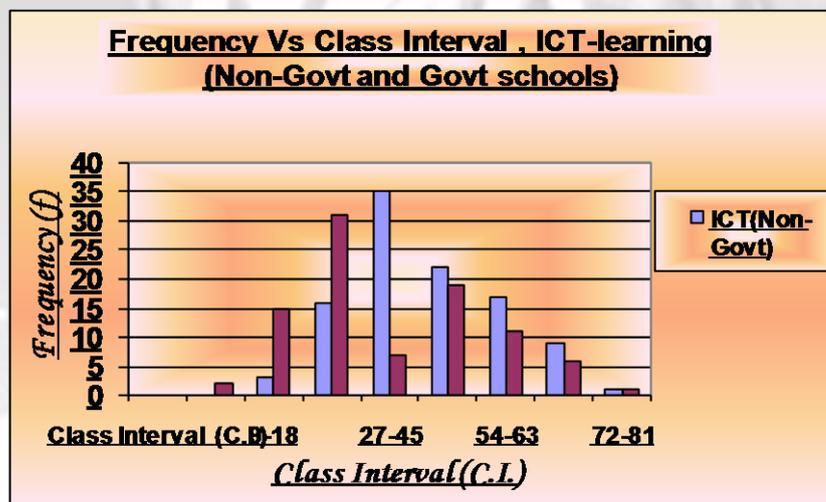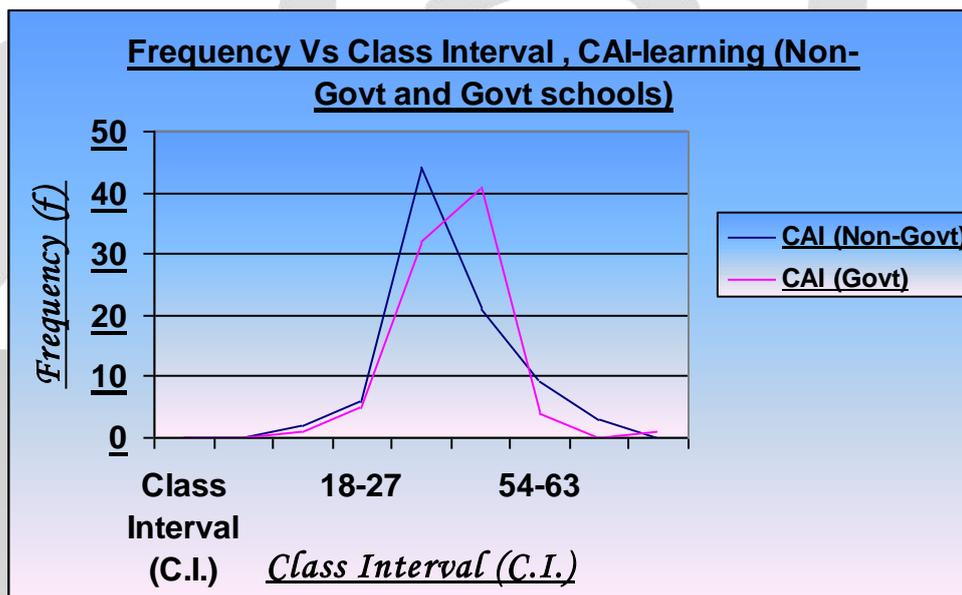

Fig. (ii)

- There exists a significant difference in the status of ICT learning among the senior secondary students of Government and Non-Government schools i.e. the Non-Government Schools have better ICT learning than that of the Government schools.

Graphical representation of CAI Learning among senior secondary students of Government and Non-Government Schools
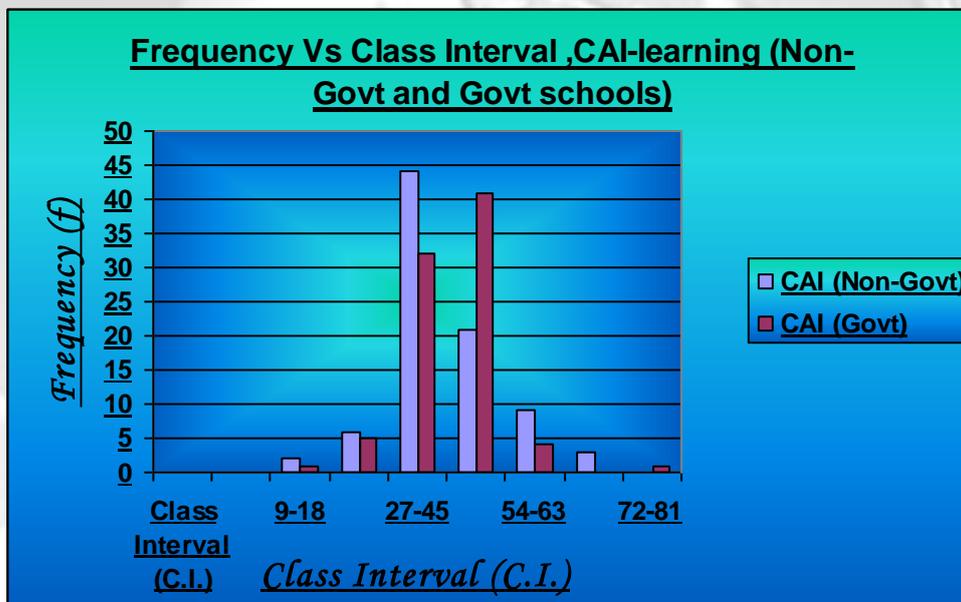
Fig.(iii)

Fig.(iv)

- There exists significant difference in the status of CAI learning among the senior secondary students of Government and Non-Government schools i.e. the Non-Government Schools have better CAI learning than that of the Government schools.

8. Suggestions - Educational implications:

- CAI and ICT based seminars and trainings should be held in the schools to make one aware of the optimum use of technologies in these studies.
- The curriculum in the whole academic activities should be connected to the CAI and ICT learning.
- The teachers as well as parents should pay proper guidance and attention towards the CAI and ICT learning.
- The projects, seminars and home assignments, all these should be given by taking CAI and ICT learning into account.
- Upto date information and training camps must be established for teachers as well as for students also.
- All schools must have the CAI and ICT based instruments and each individual must be assigned one instrument (like Computer) at one time.
- There must be provision for free Internet, Video and Audio Conferencing for teachers as well as for students.
- On-line conferencing, Desktop Video Conferencing provision must be introduced.

Research on a large scale is necessary to investigate whether the infrastructures, subsequent outcomes, are valid generaliseable in order to become more effective. However, followings are recommended: -

- The teachers may be adequately prepared, through orientation programmer, to play a supportive role in order to lead the learners towards on optimum level of attainment.
- Studies to determine the long-term effects of mnemonic strategy use with basic facts are necessary.
- Follow-up studies to determine the maintenance and generalization effects of Memory Math are needed.
- A greater understanding of the interaction of time spent in the program and increased accuracy is required.
- A greater understanding of the characteristics/necessity of classroom review would be helpful.

The status of Government schools is not satisfactory i.e. less than that of Non-Government schools .In other words, we can say that, the Government schools should be provided with the proper facilities for better outcomes of CAI and ICT learning. So, the overall achievement could be made significant by the following ways: -

i) For providing more facilities in the area of CAI and ICT learning.
ii) Optimum utilization of Existing facilities.

9. Conclusion:

The CAI and ICT learning among senior secondary students of Government and Non-Government schools are better than that of Government schools in case of Quantitative survey. While in Qualitative survey, in case of Non-Government schools, the students are well aware of the latest CAI learning and the ICT techniques. Their responses were better as compared to the Government school's students because of their keen interest in the latest technology, more strength stated for "Full Time" study while the less strength stated for "Full Time" study for CAI and ICT learning among senior secondary students of Non-Government schools and Government schools respectively.

In the Government schools the responses of the students were limited and rational. Since in Government schools, the latest facilities are not introduced, so due to lack of latest techniques the students remain unaware of the CAI and ICT learning.

10. Recommendations for further research

Taking the present investigation into account, further studies can be conducted in the following areas: -

- A study can be conducted with the same title to examine the status of CAI and ICT learning among Graduates and Postgraduates belonging to different academic streams.
- A similar study can be conducted to study the status of CAI and ICT learning among students of Rural and Urban areas.
- A study can be undertaken to examine the attitudes of teachers towards CAI and ICT learning.
- A study can also be undertaken to examine the attitudes of parents towards CAI and ICT learning.
- A study can be conducted to compare and contrast the attitude and effectiveness of CAI and ICT learning among students with special needs.
- A study can be undertaken to see the status of CAI and ICT learning in different teaching subjects or curriculum.
- A similar study can be conducted by taking the sample from all over the country.
- A study can also be conducted to compare the status of CAI and ICT learning among students of different countries like U.S.A. and India.
- A study can be undertaken to examine the status of CAI and ICT learning among different universities of different states.
- A study can also be undertaken to analyze the status of CAI and ICT learning among students of different socioeconomic status from all over the country.

11. References:

1) Aludiapillar, K. (1998). Towards Information Technology Literature Society -A Weekly Journal of Higher Education , University News December 7.

2) Asija, D.P. , (2002).   Intel teach to future, Integration of B.Ed Curriculum. In Integration of Technology in classroom Teaching , TPCC.

3) Baker,T.A. and Torgesen, J.K. (1985) .   An evaluation of Computer Assisted Instruction in phonological awareness, which below average readers .J. of Education Computing Research 13L89-103.

4) Barker,p. and Yeats, H. (1995).   Introducing Computer Assisted Learning. New Delhi : Prentice Hall International.

5) Best, W.J. (1959).   Research in Education: U.S.A. : Prentice Hall of India Inc.Englewood Cliffs, P-31.

6) Biswal, A. and Das, A. (2001).   Computer Education Curriculum for school : An Integrated Approach. J.of Ind. Edu. 27(1): 13-15.

7) Brag, V. (1985).   The Effect of Computer Assisted Instruction Upon Reading Achievement with selected Fourth Grade Children. Vol.45 (9).

8) Buch, M.B. (1991).   Fourth Survey of Research in Education (1983-1988),

9) NCERT, New Delhi.

10) Buch, M.B. (1994). Fifth Survey of Research in education (1988-1992), NCERT, New Delhi.

11) Case, A.J. (1985).   Computer Utilization in Private school of Hawaii. Dissertation Abstract International, Vol 45 (1).

12) Drever, James (1972).   A Dictionary of Psychology. London: Middle Sex Penguin Book Ltd.

13) Dubey, A. and Adhikari, R. (1999). Effectiveness of CAI in terms of Achievement of students and its Comparison with Traditional Method. Journal of Educational Technology-11 (4): 207-211.

14) Garret, H.E. (1981). Statistics in psychology and Education. Bombay: Vakils, Feffer and Simons Ltd.

15) Goel, C and Tyagi, S.K. (1988). Personalized Teacher Education: An Innovation. Journal of Educational Technology 10 (3 and 4).

16) Guilford, J.P. (1956).   Fundamental Statistice in Psychology and Education. New York: Mc Graw-Hill Book Company.

17) Harynes, High (1988).   A Study of the Effects of Computer Assisted Instruction the Academic Gains of selected Students in small Metropolitan District.Anstr Int Vol (4).

18) IMRB. (2001). Evaluating the implementation of the Intel 'Teach to the Future' Programme.

19) Jain, V.K. (1993). Computers for Beginners. New Delhi: Pustak Mahal.

20) Jindal,S. (2002). Role of Technology in Teacher Education. In Integration of Technology in classroom Teaching, TPCC; S.L. D.A.V. College of Education, Ambala City.

21) Kaul, Lokesh (1984). Methodology of Educational Research, New Delhi: Vikas Publication.

22) Lewis Anthony, Lewis Helen. (1983). Micro Computers and Schools Biology- Great Britain.