Cai in chemistry

Science, Chemistry

1 COMPUTER ASSISTED INSTRUCTION IN CHEMISTRY IN RELATION TO LEARNERS'PERSONALITYDr. R. Sivakumar Abstract The aim of this study was to find out the effectiveness of Computer Assisted Instruction in Teaching Chemistry In Relation To Learners' Personality. The sample consisted of 40 students in Control group and 40 students in Experimental group. The data were collected using appropriate tools and it was analyzed by t' and F' test. The finding is that the achievement scores of Experimental group Students were higher than the Control group Students. Introduction Today is an era of Computer.

Read thisPractice Test Chem 105

Computer finds a big place in educationaltechnology. Many research studies proved CAI has been effective in realizing the instructional objectives. But there is dearth of studies in establishing relative effectiveness among different modes of computer based instruction. The studies have also proved the effectiveness of different media changes withrespectto individual differences among learners. Under this circumstance it is inoperative to establish whether the personality of learners has any influence in determining the media effectiveness. The investigator has thus chosen computer as the medium to teach Chemistry.

The Investigator has also measured the effectiveness of teaching Chemistry through computer over the conventional method namely lecturing 2 Computer Assisted Instruction The most exciting innovation in the Educational Technology is Computer Assisted Instruction. It is a development of systematic programmed learning and teaching machine. It is a self-

instructional device with the principle of atomization. Computer Assisted Instruction as " Computer applications applied to traditional teaching methods such as drill, tutorial, demonstration, simulation and instructional games".

It is an effective media and an indispensable aid in the teaching-learning process. The instructional process carried out with the help of computer is known as Computer Assisted Instruction. It is not merely a sophisticated type of programmed instruction but a different kind of instruction altogether. It uses programmed instruction electronic data processing, datacommunication, concepts of audio-visual and media theory, communication theory, system theory and learning theory.

Computer technology is likely to influenceeducationenormously and can play an important role in enhancing the efficiency of the teaching-learning process. C. A. I. is perhaps the best, because it offers: ? Individualized instruction ? Effective interaction with the learner and ? Immediate feed backScienceIn common usage, the word science is applied to a variety of disciplines or intellectual activities, which have certain features in common. Usually a science is characterized by the possibility of making precise statements, which are susceptible 3 of some sort of check or proof.

This often implies that the situations with which the special science is concerned can be made to recur in order to submit themselves of check, although this is by no means always the case. There is observational science such as astronomy or geology in which repetition of situation at will is intrinsically impossible, and the possible precision is limited to precision of description. Science Education It we throw a bridge between science and

education, usingpsychology, we arrive at the concept of science education, which bluntly speaking, is an integrated concept.

If so it is then, within the realm of possibility to link the most powerful concepts of science to the growing minds of children through active experimental pedagogy. In that case, science education need no longer remain a single dimension activity. It would be our job then to develop the scientific and technical capabilities of our school going pupils. We may be then able to win our race in education in the 21st century. The field of science education is thus coterminous with life. This view promotes as well the inherent value system of science on a very large scale.

It is precisely for this reason that research in scion is needed and, if so, needs to be produced for relevance at an early hour. Chemistry Chemistry is a physical science related to studies of various atoms, molecules, crystals and other aggregates of matter whether in isolation or combination, which 4 incorporates the concepts of energy and entropy in relation to the spontaneity of chemical processes. Chemistry is the science concerned with the composition, structure, and properties of matter, as well as the changes it undergoes during chemical reactions.

Chemistry is the scientific study of interaction of substances called chemical substances that are constituted of atoms or the subatomic components that make up atoms: protons, electrons and neutrons. Atoms combine to produce ions, molecules or crystals. Chemistry can be called " the central science" because it connects the other natural sciences, such as astronomy, physics, material science, biology, and geology. Objectives of Teaching Chemistry

The knowledge gained about the universe is science and this knowledge is so vast that the human mind cannot comprehend it completely.

Hence science has deferent divisions as Physics, Chemistry, and Biology among these divisions " Chemistry" has a greater importance since a number of chemical compounds are applied in our day to day life. Hence chemistry becomes a vital aspect in all levels of education. ? The pupils develop scientific attitude towards chemical phenomena. ? The pupils develop the skill of enquiryobservationaccepting the facts based on repeated and relevant experimentation. ? The pupils acquire knowledge and understand the chemicals terms, facts, concepts, principles and processes. 5 The pupils apply knowledge and understanding of chemistry in unfamiliar situations. ? The pupils develop skills in handling apparatus, reporting chemical information, evidences and results using scientific technology. ? The pupils appreciate the chemical phenomena in nature and the role of chemistry in human welfare. ? The pupils develop interest in living world. Concept building is an essential goal in teaching of science. In order to make scientific concepts more meaningful, suitable communication media are needed. Need For the Study Computer is very effective for teaching learning, analysis and evaluation.

Though, the computer has flourished in many ways, there is another side in which theteachertaught through conventional method. It has been observed that there are some defects or disadvantages in conventional classroom method of teaching and learning. In this type of teaching, students have to observe classroom under tight-control and rigid supervision. It is highly laborious and time consuming. There are many types of diversion occur due

to various factor such as poor performance of the students, inadequate class room climate, excess class strength, noisy situation etc. The students can learn at their own convenience.

There performance or the assessment will not be exactly correct. They cannot be active as compare to experiment method. There are many external disturbances is learning. Thus it has been found that Computer Assisted Instruction is very much suitable method for the teaching and learning. 6 Objectives of the Study 1. To develop and validate CAI Software for teaching Chemistry for XI Standard Students. 2. To find out whether there is any significant difference between the students' achievement scores in Chemistry of the control group and experimental group at Pre - test level. 3.

To find out whether there is any significant difference between the students' achievement scores in Chemistry of the control group and experimental group at Post - test level. 4. To find out the effect of CAI software on the achievement in Chemistry in different learning objectives such as Knowledge, Understanding, Application and Skill. 5. To find out whether there is any significant difference between control and experimental group of students' achievement in Chemistry of various categories of sub-samples wise. i. Gender ii. Locality of the students iii. Parental Education v. Parental Occupation v. Computer Knowledge and vi. Residence of the Students 6. To find out the effect of CAI software on the achievement in Chemistry among control and experimental group of students based on different Personality types. 7. To find out whether there is any significant difference in the achievement of the follow-up tests conducted during the treatment for XI standard students. 7 Hypotheses of the Study 1. There is no significant

difference between the students' achievement scores in Chemistry of the control group and experimental group at Pre-test level. 2.

There is no significant difference between the students' achievement scores in Chemistry of control group and experimental group at Post-test level. 3. There is no significant difference among groups taught through CAI and Lecture method on the achievement in Chemistry in different learning objectives such as Knowledge, Understanding, Application and Skill. 4. There is no significant difference among groups taught through CAI and Lecture method on the achievement in Chemistry with respect to students' classified on the basis of i. Gender ii. Locality of the students iii. Parental Education iv. Parental Occupation . Computer Knowledge and vi. Residence of the Students 5. There is no significant difference among groups taught through CAI and Lecture method on the achievement in Chemistry with respect to students' personality types. 6. There is no significant difference in the achievement of the follow-up test conducted during the treatment for XI standard students. Methodology An experiment involves the comparison of the effects of a particular treatment with that of a different treatment or of no treatment. In a sample conventional 8 experiment, reference is usually made to an experimental group and to a control group.

These groups are equated as nearly as possible. The experimental group is exposed to the influence of the factor under consideration; the control group is not observation is made to determine to what difference appears or what change or modification occurs in the experiment as contrasted with the control group. The present study, which aims at finding the Computer Assisted Instruction in Teaching Chemistry for XI Standard Students, has

been designed using the methodology as Experimental method. Sample of the Study The Investigator selected 200 students in XI Standard.

Out of these 200 students, 80 students were selected, based on their performance in the half-yearly exam, which is a common one. For that, those students who have secured 60% and above marks are alone selected. Further an entrance test prepared by the Investigator was administered to the 80 students thus selected. Based on the marks of the entrance test, students were arranged in descending order. From that the Investigator selected the first one for control group, next for experimental group. The control group consists of odd number of students and experimental group consists of even number of students.

Control group was exposed to traditional method of teaching. It consists of 40 students of XI standard. In the same way experimental group was given treatment through Computer Assisted Instruction in teaching. It also consists of 40 9 students of XI standard. Thus 80 students were the total sample selected for this study. Tools Used 1. Syllabus based CAI software packages were developed for the topic " Chemical Bonding" of XI Standard Chemistry. 2. Syllabus based Pre-Test and Post-Test Materials were prepared and validated. 3. Myers-Briggs Types Indicator (MBTI) Personality test was used. (Developed and Standardized by Jung, 1971) 4.

The Personal data of the samples were collected through the questionnaire. Statistical Techniques Used Statistical techniques serve the fundamental purpose of the description and inferential analysis. The following statistical techniques were used in the study. 1. 't' test was applied to analyze the deferential hypothesis. 2. 'f' test was used to find out the significance of

relationship between the Sub-group variables. Analysis of Post-Test Performance The following table furnishes the data on the Post-Test performance of the Control and Experimental groups and also furnishes the significance of ifference between the achievement scores of students in various groups in detail. SIGNIFICANCE OF DIFFERENCE BETWEEN THE ACHIEVEMENT SCORES OF THE CONTROL AND EXPERIMENTAL GROUP IN PRE-TEST LEVEL Sl. No. Variable N Mean S. D. t' Test Level of Significant 1 Control 40 14. 3 1. 9 0. 55 Not Significant at 0. 05 level Experimental 40 14. 1 2. 16 10 SIGNIFICANCE OF DIFFERENCE BETWEEN THE ACHIEVEMENT SCORES OF THE CONTROL AND EXPERIMENTAL GROUP IN POST-TEST LEVEL Sl. No. Variable N Mean S. D. t' Test Level of Significant 2 Control 40 71. 27 6. 44 17. 35 Significant at 0. 05 level Experimental 40 90. 6 2. 83

SIGNIFICANCE OF DIFFERENCE BETWEEN THE ACHIEVEMENT SCORES OF THE CONTROL AND EXPERIMENTAL GROUP IN DIFFERENT LEARNING OBJECTIVES SUCH AS KNOWLEDGE, UNDERSTANDING, APPLICATION AND SKILL Sl. No. Objectives Variable N Mean S. D. t' Test Level of Significant 3 Knowledge Control 40 26. 08 2. 76 13. 88 Significant at 0. 05 level Experimental 40 32. 3 1. 11 4 Understanding Control 40 21. 3 2. 02 23. 58 Significant at 0. 05 level Experimental 40 29. 45 0. 85 5 Application Control 40 12. 2 1. 22 16. 05 Significant at 0. 05 level Experimental 40 15. 6 0. 55 6 Skill Control 40 11. 7 1. 21 4. 74 Significant at 0. 05 level

Experimental 40 12. 95 1. 07 SIGNIFICANCE OF DIFFERENCE BETWEEN THE ACHIEVEMENT SCORES OF STUDENTS WITH RESPECT TO GENDER, LOCALITY, KNOWLEDGE OF COMPUTER AND RESIDENCE Sl. No. Variable Sub Variables N Mean S. D. t' Test Level of Significant 7 Gender Boys 20 90. 5 3. 05 0. 221

Not Significant at 0. 05 level Girls 20 90. 7 2. 65 8 Locality Rural 24 90. 83 2. 61 0. 635 Not Significant at 0. 05 level Urban 16 90. 25 3. 17 9 Knowledge of Computer With Computer Knowledge 13 88. 84 2. 37 3. 11 Significant at 0. 05 level With out Computer Knowledge 27 91. 44 2. 66 10 Residence Hosteller 18 89. 66 2. 78 1. 94 Not Significant t 0. 05 level Day Scholar 22 91. 36 2. 68 11 SIGNIFICANCE OF DIFFERENCE BETWEEN THE ACHIEVEMENT SCORES OF STUDENTS WITH RESPECT TO PARENTAL EDUCATION AND PARENTAL OCCUPATION Sl. No. Variable Categories Sum of Squares df Mean F Level of Significant 11 Parental Education Between Groups 9. 079 2 4. 540 0. 555 Not Significant at 0. 05 level Within Groups 302. 521 37 8. 176 Total 311. 600 39 12 Parental Occupation Between Groups 427. 746 5 8. 549 1. 08 Not Significant at 0. 05 level Within Groups 268. 854 34 7. 907 Total 311. 600 39 SIGNIFICANCE OF DIFFERENCE BETWEEN THE ACHIEVEMENT SCORES OF THE CONTROL AND

EXPERIMENTAL GROUP IN DIFFERENT TYPES LEARNERS' PERSONALITY Sl. No. Variables N Mean SD t Level of Significant 13 Extroversion 22 89. 09 2. 43 4. 59 Significant at 0. 05 level Introversion 18 92. 44 2. 12 14 Sensing 14 92. 14 1. 95 3. 07 Significant at 0. 05 level Intuition 26 89. 76 2. 91 15 Thinking 17 92. 29 2. 31 3. 8 Significant at 0. 05 level Feeling 23 89. 34 2. 53 16 Judging 15 88. 73 2. 96 3. 7 Significant at 0. 05 level Perceiving 25 91. 72 2. 09 SIGNIFICANCE OF DIFFERENCE BETWEEN THE ACHIEVEMENT SCORES OF THE CONTROL AND EXPERIMENTAL GROUP IN FOLLOW-UP TEST Sl. No. Variable N Mean S. D. ' Test Level of Significant 17 Control 40 71. 25 7. 15 14. 8 Significant at 0. 05 level Experimental 40 89. 32 2. 89 FINDINGS 1. The calculated t' value 0. 55 is very much lesser than the critical value 1. 99 at 0.

05 level of significant. This implies that the difference in the achievement of Control group and Experimental group is not significant. 12 2. The calculated t' value 17. 35 is very much greater than the critical value 1. 99 at 0. 05 level of significant. This implies that the difference in the achievement of Control group and Experimental group is significant. 3. The calculated t' value 13. 8 is greater than the critical value 1. 99 at 0. 05 level of significant. This indicates that the difference in the achievement of Control group and Experimental group is significant in the learning objective Knowledge level. 4. The calculated t' value 23. 58 is greater than the critical value 1. 99 at 0. 05 level of significant. This indicates that the difference in the achievement of Control group and Experimental group is significant in the learning objective Understanding level. 5. The calculated t' value 16. 05 is greater than the critical value 1. 99 at 0. 05 level of significant.

This indicates that the difference in the achievement of Control group and Experimental group is significant in the learning objective Application level. 6. The calculated t' value 4. 74 is greater than the critical value 1. 99 at 0. 05 level of significant. This indicates that the difference in the achievement of Control group and Experimental group is significant in the learning objective Skill level. 13 7. The calculated t' value 0. 221 is very much lesser than the critical value 2. 02 at 0. 05 level of significant. This indicates that the difference in the achievement of Boys and Girls is not significant. . The calculated t' value 0. 635 is lesser than the critical value 2. 02 at 0. 05 level of significant. This indicates that the difference in the achievement Rural and Urban area students is not significant. 9. The calculated t' value 3. 11 is greater than the critical value 2. 02 at 0. 05 level of significant. This

indicates that the difference in the achievement of students having with computer knowledge and without computer knowledge is significant. 10. The calculated t' value 1. 94 is lesser than the critical value 2. 02 at 0. 05 level of significant.

This indicates that the difference in the achievement of Day Scholar and Hosteller students is not significant. 11. The calculated F' value 0. 555 is lesser than the Critical value 3. 23 at 0. 05 level of significant. It implies that the difference in the achievement of the Student of various groups, based on their Parental Education is not significant. 12. The calculated F value 1. 08 is lesser than the Critical value 2. 48 at 0. 05 level of significant. It implies that the difference in the achievement of the Student of various groups, based on their Parental Occupation is not significant. 4 13. The calculated t' value 4. 59 is greater than the critical value 2. 02 at 0. 05 level of significant. This indicates that the difference in the achievement of extroversion and introversion personality type students is significant. 14. The calculated t' value 3. 07 is greater than the critical value 2. 02 at 0. 05 level of significant. This indicates that the difference in the achievement of sensing and intuition personality type students is significant. 15. The calculated t' value 3. 8 is greater than the critical value 2. 02 at 0. 05 level of significant.

This indicates that the difference in the achievement of Thinking and Feeling personality type students is significant. 16. The calculated t' value 3. 7 is greater than the critical value 2. 02 at 0. 05 level of significant. This indicates that the difference in the achievement of Judging and Perceiving personality type students is significant. 17. The calculated t' value 14. 8 is very much greater than the critical value 1. 99 at 0. 05 level of significant.

This implies that the difference in the achievement of Control group and Experimental group students is significant. Summary of the Findings

The major finding of the study reveals that Experimental method of teaching more effective than the Traditional method in teaching Chemistry. In other words teaching Chemistry by using CAI is more effective. There is no significant difference between the Control group and Experimental group in the pre-test. But in the post-test the Experimental group performed better than the Control group. 15 Conclusion From the above study, the investigator has an idea that CAI provides greater opportunities for the students to learn. It is better than the traditional method of learning.

It brings a new kind of experiences for the students in Higher Secondary Schools. Therefore, the investigator desires that more number of Educational institutions should teach Chemistry by using CAI and make the process of teaching and learning more effective. References Aggarwal, Y. R. , (1998), " Statistical Methods", Sterling Publications Pvt. ltd. , New Delhi. Best J. W. , (2003), " Research in Education", Ninth Edition, Prentice Hall of India, New Delhi. Gupta and Jangir (1998), Cell Biology - fundamental and applications, Published Agro Botanica, Bikaner. Kent, W. A. Lewis, R. (1994), Computers Assisted Learning in the Humanities and social sciences, Blackwell scientific publications, London. Lewis R. , (1997), Trends in computer assisted education, Blackwell scientific Publications, London. Mangal S. K. , (2005), " Statistics in Psychology and Education", Second Edition, Prentice Hall of India, New Delhi. Mridula D. Ranade (2001), " Science Teaching through Computer Assisted Instruction: Research Findings and Insights" SNDT

Women's University, Pune, India. Percival Fred (1994), " A handbook of Educational Technology", Cogan pages Publishing House, London.