Effectiveness of Utilizing Computer-Assisted Instructions in the form of Tutorial Mode (CAITM) on the Retention Level of Students at the Elementary Level in the Subject of Pakistan Studies

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Abstract

The study aimed to analyze the effectiveness of utilizing computer-assisted instructions in the form of tutorial mode on the retention level of the students at the elementary level in the subject of Pakistan Studies. The objective of this research was to catch the influence of CAITM on the retention level of the 8th class pupils in the course of Pakistan Studies. Total Forty participants including males and females of the 8th class were chosen as sample from Federal Government School in Cantt area of Risalpur. The chosen group was further divided into bi-parallel groups by using the practice of pair random on the basis of pretest scores. The "Post-test Only Equivalent Group Design" was applied on this study. The post test was applied for data collection. A t-test for an independent sample was applied for concluding the findings from the data. The consequences of the endeavor showed that the members of the group under investigation retained learned contents for a long time as compared to the control group, which confirms that the applied strategy played a significant role in the retention level of the students. On the basis of findings, it is proposed that CAITM may be integrated with other teaching strategies to enhance the retention level of the students in different subjects of social sciences. CAITM has multidimensional perspectives and may be explored by investigating by applying diverse samples in different areas of the world.

Keywords; computer, instruction, retention, tutorial mode, information and communication technology

Introduction

It is reported that the impact of modern technology especially the use of computers is much more than any other tool of ICT (Fares, 2007). In the early era of technology, computers were only used for some special types of estimation and jobs. They were so expensive and occupied a great space, but in the latter times, the invention of microprocessors brought a revolution in the history of computers (Chin, 2011). Now the computers were accessible to everyone. Now computer technology has been incorporated into the education sector. Computers became affordable for most people (Dublin, 2003). Schools and other educational institutions

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have been equipped with modern computer technology. ICT, CBT, CAI, and CAITM teaching and learning programs were introduced (Adeyemi, 2012). This rapid change in the education sector has entirely altered the academic environment. Teachers can teach their pupils virtually. They do not need any class environment (Hashmi, 2002). As it is obvious that each and every teacher has a passion for his or her students to learn more and more knowledge (Jung, 2005). He wants that his students retain more and more knowledge for a long time instead of memorizing it. Teachers feel great difficulty in teaching a broad spectrum of the school curriculum (Watson, 2010). Just memorizing the text cannot build a strong understanding of students` memory (Almosa, 2002). In traditional classrooms, teachers face various difficulties related to the completion of the syllabus and streamlining. If they focus on the completion of the course outline, they fail to teach the students in an effective manner (Eom, 2012).

According to Rossi (2009), various teachers use different traditional styles in teaching. Some teachers teach their students through the lecture method, some assign vocabulary and terms to their students to memorize. Rote learning can be helpful in the early education of kids. But these methods do not enhance the cognitive skills of students in later education (Liu & Wang, 2009). In this scenario, CATIM plays a pivotal role. It not only improves cognitive skills but also develops the understanding of the pupils (Zeitoun, 2008). Rice (2008) explains that pupils can develop their own thinking and ideas about a phenomenon. CAITM-based learning never makes the students bored. Students are kept motivated and active percipient (Adomi & Anie, 2006). They create their own perception of a phenomenon that broadens their thinking and cognitive skills (Ary, 2010). The application of the CAITM-based technique in educational scenarios creates numerous opportunities for the students and teachers to work in a conducive environment (Farrah, 2007).

The use of CAI tutorials helps students and teachers to cooperate with each other in an effective manner. It results in the development and improvement of quality education (Malik, 2012). Before going through CAITM based teaching process, a teacher has to keep in mind the following things; the use of technology is effective; it will not bring any inconvenience and disturbance; the teacher should know how to use technology (Ozkan & Koseler, 2009). Pakistan studies and social studies are core subjects taught in almost all educational institutions in Pakistan (Khan, 2005). Historical events, facts, and figures are sometimes very difficult for the students to memorize and retain for a long time (Tabassum, 2004). Sometimes students feel these subjects are boring and uninteresting. Teaching through CAITM-based tutorials can enable students well-motivated and active participants (Alselem, 2004). The

CAITM helps students in understanding the different concepts in a very interesting way. These are also very helpful for the teacher to teach their students Creswell, 2003).

Statement of the Problem

The following study was entitled to investigate the effectiveness of utilizing computer-assisted instructions in the form of tutorial mode (CAITM) on the retention level of students at the elementary level in the subject of Pakistan Studies.

Study's Objective

The major purpose of this research study was to catch the influence of CAITM on the retention level of 8th class pupils studying the course of Pakistan Studies.

Study's Hypothesis

H0 1: There is no considerable variance on retention level between the experimental and control groups.

Significance of the Study

This work might be significant in the sense that it helps teachers and educators to inculcate the basic concepts of the subject material into the minds of the students. CAITM-based teaching helps the teachers to transfer most of their burden to computer-based tutorials. The adoption of CAITM-based learning programs in schools creates a conducive environment for learning. Most students want to work on computers willingly (Abu Shawar, 2009). CAITM-based tutorials allow them to work autonomously. They do not need any teachers. So, they own whatever they learn from the program. CAITM-based learning has along with the last effect as compared to other traditional learning (Lewis, 2000). It helps the students to understand difficult and complex concepts in a simple and easy way. The research study may be significant enough for future research scholars. It may be helpful for educational planners for future planning.

Literature Review

The application of technology in the field of education has put a great impact on educational research and learning. The benefits of quality of education deal with quality of research (Chen, 2011). Computer-assisted instructions have the capacity to enhance, innovate and polish the skill of the students. CAI has a positive influence that motivates, inspires, and engages the students in a better way (Watson, 2010). CAI-based learning helps the pupils to incorporate the school experiences into job

practices in order to economic feasibility for future employees (Khan, 2005). Computer-based teacher-learning activities especially in the form of tutors are also a modified application process for teaching and learning. CAITM which is a modern learning process plays an outstanding role in the field of education (Morris, 2001).

Nowadays the education world pursues modern technology with great zeal and enthusiasm. Now, the time has come that space would be created for technology to be accommodated in education (Ary, 2010). The rapid growth in technology has broadened the ways to success and acceleration. The student of this era has numerous opportunities to dominate himself. ICT tools help the students to be self-sufficient. Digital technology has entered our educational institutions (Jung, 2005). Digital labs and digital research chambers have been established in various advanced research institutions. Digitalization has brought a revolution in the field of education and economics (Dublin, 2003)

Buda and Middleton (2003) have an opinion that in Conventional teaching, the content of the study has been focused. Teaching is done with different conventional methods such as lecture method, demonstrative or grammar-translation method. Rote memorization and rehearsal teaching techniques have been used in educational institutions (Cliff, 2004). But the contribution of these methods and techniques is minor as compared to modern techniques. The integration of CAITM in the contemporary settings of education is now supporting curricula so as to endorse proficiency, competency, and performance (Farrah, 2007).

Computer-based instruction can perform a pivotal role in the educational sector. CAITM helps in creating a real learning environment for the students so that they can learn the study material in an effective manner (Malik, 2012). Different educational institutions have been working on the enhancement of students` achievements by implementing, maintaining, and improving computer technology (Rossi, 2009). According to Adomi and Anie (2006), more research would be conducted to validate the implementation of CAITM. The aim of these research studies would be to assess the credibility and validity of the CAITM based learning Programmes. CAITM based teaching and learning Programmes spit positive impacts in the classroom. CAITM based learning Programmes keep students intact and well-motivated (Clark & Mayer, 2003). Research studies have exposed that CAITM based learning has a positive effect on students` achievements (Eom, 2012).

CAITM-based learning technique provides various opportunities for the students to retain the learning for log time (Zeitoun, 2008). As it is discussed earlier the CAITM-based program never detracts the students. It keeps the students active and well-motivated (Farooq, 2001). Students

participate in the learning programs as active participants. This can improve their retention level. Therefore, they retain knowledge for a long time. CAITM plays a significant role in the improvement of the retention level of the students (Hashmi, 2011).

According to Creswell (2003), the desired support in the learning process enhances the student's participation which results in positive outcomes and the same role can be played by CAITM if incorporated positively. The above discussion reveals that strengthening behavior helps the students to understand the concepts and enhance their skills and understanding. The CAITM can help the students to boost their cognitive skills (Dublin, 2003).

Research Methodology

This segment of the study elaborated on the procedure adopted to run this research activity. Further, this section has elaborated the method of selection of population and sample for the study. The procedure adopted for data collection and analysis was also explained as recommended by (Gay & Airasian 2000).

Design of the study

According to the nature of the study experimental procedure was adopted to compare the performance of the two groups. As both groups were equivalent in academic performance before the treatment session, Farooq (2001) recommended the best suitable design, the "*post-test only equivalent group design*". Therefore, the said design was adopted to compare the performance of the students and the effectiveness of the independent variable used in the study.

Population of the Study

The study was conducted in a Federal Government School; therefore, all the students of both genders at the elementary level in Federal Government schools located in the Cant areas of Khyber Pakhtunkhwa comprised the population of the study.

Sample of the study

Total Forty participants including males and females of the 8th class were chosen as sample from the Federal Government School located in Risalpur Cantt. The chosen group was further divided into bi-equivalent groups by using the technique of pair random on the basis of pretest scores in the monthly test conducted by the school.

Research Instrument

The researcher developed a teacher-made post-test research tool in line with the directions of subject experts and consulted with the supervisor as well. To enhance the validity of the tool, it was subjected to pilot testing and expert opinions were incorporated accordingly.

Reliability of the Research Instrument

The reliability of the post-test test was determined by using the Split half technique. The test items were divided into two equal halves by using the even-odd method. "Spearman-Brown Prophecy formula" was administered to check the reliability of the research instrument. The established co-efficient of reliability was 0.74 which was satisfactory.

Data Collection

Lesson plans were developed for the control group using the traditional lecture-cum-demonstration method. The CAITM-based programs were developed for the experimental group. The groups under investigation were subjected to the same learning material in different schoolrooms. The treatment activities last for six weeks. After completion of the proposed time, a post-test was administered to both groups. A retention test was also taken from both groups after one month of the completion of the experiment and data was collected.

Procedure for data collection

Two subject specialist teachers were selected for the proposed study. One experienced teacher was for the control group. The researcher himself taught the experimental group using CAITM-based activities while the other group was instructed through the conventional lecture-demonstration method. Lesson plans were developed for both the control group and the experimental group. After groups formation, the research activity was executed and both groups were taught the same learning material in different classrooms. The treatment activities last for six weeks. After completion of the proposed time, a post-test was administered to both groups. In order to test the claim of this study after completion of one month, a retention test was taken from both groups and their performance was recorded for further analysis.

Data Analysis

After collecting the data both descriptive and inferential statistics were applied. For reading the clear picture of data Mean and Standard

Deviation were calculated and then applied independent sample t-test for reaching to a significant result. The hypotheses were tested on a 0.05 level of probability.

H0 1: There is no substantial variance in retention levels between the experimental group and the control group.

Table.1

Substantial variance in retention level between the experimental group and control group

Group	N	M	S. D		t-test
Control Group	20	44.6	8.11	2.17	7.08
Exp Group	20	59.6	4.87		

df= 38; table value at 0.05=2.02

The above table displays that the t-value (calculated as 7.08) is bigger than the critical value (2.02) on the table keeping the significance value is 0.05 levels. So, this evidence has rejected the null hypothesis. On the bases of this explored evidence, it can be interpreted that the difference between the two groups is acceptable and substantial. The applied strategy had a long-lasting significant consequence on the retention level of the participants of the experimental group.

Results and Discussion

The calculated t-value is greater than the table value (7.08>2.02) at the significance level of 0.05. So, this evidence does not fall in the support of null hypothesis and is hence rejected. On the bases of explored evidence, it can be interpreted that the difference between the mean scores of experimental and control groups on the retention level test is significant. This fact explains that CAITM has a significant influence on the retention level of learners in the experimental group. The same finding also came in the line explored by Bloomfield, Roberts, and While, (2010) that computer-based instruction has a significant effect on the retention level of the students. Granito and Chernobilsky, (2012) also advocated that the use of technology can also enhance the retention level of the students. Hence the CAITM recorded a long-lasting significant influence on the retention level of the participants of the group under investigation.

Conclusions

In the line with the empirical studies discussed above and confirmation of the current study, it is decided in the favor of CAITM had

a long-lasting significant effectiveness on the retention level of the participants of the experimental group.

Recommendations

Keeping in view the above findings and discussions some recommendations were made and listed here;

1. The research study explicates that using computers in the shape of the current strategy had an ample influence on the retention level of students at the elementary level. Hence, it is proposed that CAITM based learning process may be included in academic programs at different levels of academics.
2. The use of the *CAITM*-based learning strategy established substantial outcomes in the subject of Pakistan Studies. Therefore, it is suggested that this technique may be applied to other disciplines.
3. The CAITM-based research program confirmed its significance at the elementary level. So, it is recommended that this research may be carried out on a secondary level.
4. CAITM-based learning strategy involved computer skills and competency, it is, therefore, recommended that computer-based in-service training programs may be arranged for teachers.

References

Abu Shawar, B., (2009). Learning Management System and its Relationship with Knowledge Management. In: Faculty of Computer & Information science, Ain Sham University, *4th International Conference on Intelligent Computing and Information Systems.* Cairo, Egypt March 19-22, 2009.academic transformation: An interview with Carol A. Twigg. *Innovate 2*(3).

Adeyemi, B. A. (2012). Effects of Computer Assisted Instruction (CAI) on students' achievement in social studies in Osun State, Nigeria. *Mediterranean Journal of Social Sciences.3.2.269-277.*

Adomi, E.E., & Anie, S.O.(2006). "An Assessment of Computer Literacy Skills of Professionals in Nigeria University Libraries", *Library Hi Tech News,* Volume 23, No. 2, pp. 10-14, 2006.

Almosa, A. (2002). *Use of Computer in Education*, (2nd ed), Future Education Library Publication, Riyadh.

Alsalem, A. (2004). *Educational Technology and E-learning*, Riyadh: Alroshdpublication

Andersson, A. (2008). Seven Major Challenges for e-learning in Developing Countries: Case Study eBIT, Sri Lanka, *International Journal of Education and Development using ICT,* Vol 4, Issue3

Ary, D. (2010). *Introduction to Researching Education* (8th ed.). (C. Short, Ed.) Belmont, USA, United State of America: Wadsworth

Bloomfield, J., Roberts, J., & While, A. (2010). The effect of computer-assisted learning versus conventional teaching methods on the acquisition and retention of handwashing theory and skills in pre-qualification nursing students: a randomised controlled trial. *International Journal of nursing studies*, *47*(3), 287-294.

Boud, D., & Middleton, H. (2003). 'Learning from others at work: communities of practice and informal learning', *Journal of workplace learning*, vol. 15, no.5, pp.194-202

Buda, A. (2010). Attitudes of teachers concerning the use of ICT equipment in education. *Journal of Social Research & Policy*, 131-150.

Chen, J.-L. (2011). The effects of education compatibility and technological expectancy on e-learning acceptance. *Computers & Education*, 57(2), pp.1501–1511.

Clark, R. C., & Mayer, R. E. (2003). *e-learning and the science of instruction*. San Francisco: Jossey-Bas

Cliff, Y. (2004). Effects of computer-assisted instruction on students' achievement in Taiwan: A meta-analysis. *Computers & Education, 48*, 216-233.doi: 10.1016/j.compedu.2004.12.005

Creswell, J.W. (2003). "*Research Design: Qualitative, Quantitative and Mixed Method approaches*". 2nd edition. Thousand oaks, CA: Sage.

Dowling, C., Godfrey, J. M. & Gyles N. (2003). "Do Hybrid Flexible Delivery Teaching Methods Improve Accounting Students' Learning Outcomes," *Accounting Education: An International Journal,* 12 (4), 373-391.

Dublin, L. (2003). If you only look under the street lamps……Or nine e-Learning Myths. *The eLearning developers journal*. http://www.eLearningguild.com.

Eom, S.B., (2012). Effects of LMS, self-efficacy, and self-regulated learning on LMS effectiveness in business education. *Journal of International Education in Business*,5(2), pp.129–144.

Fares, A. (2007). *ICT Infrastructure, Applications, Society, and Education*. Nairobi's trathmore University.

Farrah, B. (2007). *An Evaluation of Pakistan studies, text Book of Higher Secondary Level* as prescribed by Punjab text book Board of Intermediate Secondary Education, *unpublished thesis of National University of Modern Languages, pp, 19-25*

Fatima, H.Z., Shafique, F., & Firdous, A. (2012). "ICT Skills of LIS Students: A Survey of Two Library Schools of the Punjab", *Pakistan Journal of Library & Information Science*, 2012.Available at http://pu.edu.pk/home/journal/ 8. 2012.

Farooq, R. A. (2001). *Understanding Research in Education.* Rawalpindi, University Institute of Education: University of Arid Agriculture.

Fry, K. (2001). E-learning markets and providers: some issues and prospects. *Education Training*,233-239.

Gay, L. R., & Airasian, P. W. (2000). *Student guide to accompany educational research: Competencies for analysis and application*. Merill.

Granito, M., & Chernobilsky, E. (2012). The effect of technology on a student's motivation and knowledge retention.

Hashmi, K. (2011). *An Analytical Study on Issues, Challenges and Reforms in the Pakistan Studies,* Higher Education Commission: Islamabad. Dawn, http://www.dawn.com/news/862017/teaching-ofpakistan-studies.

Hemsley, C. (2002). Jones International University's focus on quality eLearning opens doors for students worldwide. *Business Media*, 39(9), pp. 26-29.

Jung, I. (2005). ICT-Pedagogy Integration in Teacher Training: *Application Cases Worldwide. Educational Technology & Society,* 8 (2), 94-101.

Khan, B. H. (2005). *Managing E-learning: Design, Delivery, Implementation and Evaluation* Hershey, PA: Information Science Publishing.

Lewis, N. J. (2000). The Five Attributes of Innovative E-Learning, *Training and Development*, Vol.54, No. 6, 47 51.

Liu, Y., & Wang, H. (2009). A comparative study on e-learning technologies and products: from the East to the West. *Systems Research & Behavioral Science, 26*(2), 191–209.

Malik, S. K. (2011). Teaching of Pakistan studies at secondary level: A review. *Elixir Social Studies*, *43*, 6738-6745.

Morris, E. J. (2001). The design and evaluation of Link: A computer-based system for correlation. *British Journal of Educational Technology*, 32, 39–53.

Ozkan, S. & Koseler, R. (2009). Multi-dimensional students' evaluation of e-learning systems in the higher education context: An empirical investigation. *Computers &Education,* 53(4), pp.1285–1296.

Rice, K., L. (2008). *Going virtual! Unique needs and challenges of K–12 online teachers*. International Association for K–12 Online Learning. http://www.inacol.org/research/docs/goingvirtual.pdf.

Rossi.P.G. (2009). Learning environment with artificial intelligence elements. *Journal of e-learning and knowledge society*, 5(1), 67-75.

Sadler-Smith, E. (2000). "Modern" learning methods: rhetoric and reality. *Personnel Review*, 29(4), 474-490.

Salmon, G. (2004). *E-moderating: the key teaching and learning online*. (2nd Ed.) UK: Routledge.

Tabassum, R. (2004). Effects of Computer Assisted Instruction (CAI) on the Secondary school students' achievement in science. Unpublished PhD thesis. University of Arid Agriculture. Rawalpindi.

Watson, J., A. (2010). *Keeping pace with K–12online learning: An annual review of policy and practice*. Durango, CO: Evergreen Education Group.

Zeitoun, H. (2008). *E-learning: Concept, Issues, Application, Evaluation*, Riyadh: Dar Al Solateah publication.