

Impact of Information Communication Technologies pedagogy for Retention

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Abstract *The present study investigated the impact of ICT pedagogy for the retention of the students. This was an experimental investigation in two schools. The 120 participants were exposed to the experimental and controlled investigation in such a way that each group has 60 students. The experimental group was given the treatment of ICT pedagogy while the lecture pedagogy was in the control group. The testing was done for academic achievement after one month and after two months for retention, through a retention test. The result depicted the highest achievement in the favor of experimental group taught with ICT instructional methodology.*

Key Words
Information
Communication
Technology, Retention,
experimental study,
teaching pedagogy

Introduction

Individuals are struggling for better education (Bhakta and Dutta, 2016). The education in the 21st century isn't like education in the old ages. In the mature age, the focal point of the students was on the remembrance of ideas, whereas today we are focusing on modern technologies.

The researchers of the universes are competing for the discovery of such approaches and techniques which may prove beneficial and elevate the school's education up to its maximum high level. The digital era has totally molded the system of education, today, for example, Digital storytelling utilized in the advanced period to teach the learners in a better way (Ohler, 2008).

In the modern age, education without technology is the dream. We, are using the technologies in all walks of life and so is the case with education, the technologies are used for best results of the students in different subject areas (Dror, 2008)

Today the national development depends on the use of technologies in different areas, the same is the situation with education. In schools, we are utilizing technologies to upgrade the system of education and to uplift it as per with the international standards (Bordar, 2010)

Distinctive research studies detailed that the utilization of ICT for the purpose of teaching has expanded the degree of scholastic accomplishment. The examination shows that there exists an association between ICT assignment and Educational accomplishment in a moderate situation. In addition, the consequences of the investigation directed by (Basri, Alandejani and Almadani, 2018) likewise demonstrated that the utilization of ICT improved the accomplishment of the female students more than the male students. The specialists of the world are utilizing technology in education as an alternate method to improve the scholarly accomplishment of the students. Hence, the present examination was attempted to look at the impacts of ICT approaches on the students' advantage and accomplishment in the southern District Dera Ismail Khan.

The present investigation, therefore, is a type of struggle to check the results of the ICT in the schools for teaching-learning process, at higher secondary level in mathematics.

Statement of the problem

Although many efforts have been made to educate the students and maintaining the literacy rate high and upgrading the system of education, the goals have not been achieved until now, at its satisfactory level in Pakistan. The educators and hushed for molding the system of education and struggled for new policies and researches in the education field, but the results are leading towards the failure and Pakistan could not get its literacy rate up to 60 after long lasting efforts and policies. Many pieces of research were conducted in different areas and investigators suggested and recommended the research using technologies, therefore this investigation looks into the use of Information Communication Technologies (ICTs) effects in the mathematics subject areas.

Objectives of the study

To check the mathematics achievement at the higher secondary level taught through ICT instructional approach and traditional pedagogy

To check the mathematics retention at the higher secondary level taught through ICT instructional approach and traditional pedagogy

Study significance

The investigation is significant for parents, teachers, and students. The true pedagogy is the heart of teaching. The result of the investigation may be applied to the higher secondary schools in the subject of mathematics. The schools using the most effective methodology may lead to better achievement and retention in the light of this investigation. Parents may admit the children in those institutions which are more results-oriented.

Null Hypotheses

H₀₁: No significant difference is estimated in the mathematics attainment at the higher secondary school level when taught through traditional pedagogy and ICT instructional approach

H₀₂: No significant difference is estimated in the mathematics retention at the higher secondary school level when taught through traditional pedagogy and ICT instructional approach

Literature Review

Academic Achievement

This is a comprehensive term used for different meanings in the different setting, here the term is used as the scholastic achievement in any subject area. It is the degree of enrichment in the school subjects, this determines that up to which level the students get success in the examination. Although the term is used to measure the different levels of success in the different types of tools of measurement, majorly it is considered as the gauge used for the measuring results after the examination and the different tests which are used at the school level. The summative and formative evaluation, all is done by measuring through the achievement of students using tests and assignments.

It will be no wrong to say that the score that the students achieve in the standardized tests like the NTS and the teacher's tests on daily basis actually measure the achievement of the students.

Consistent appraisal and tests are usually used to gauge the academic achievement yet specialists don't concur on one regular method for the best assessment of it. Which perspective is progressively huge in this respect is likewise unsure. In this manner, there is no full and last form of appraisal for estimating educational achievement. There are numerous elements influencing the wonder. For instance, sickness, wretchedness, tension, terrible climate, local issues, passionate insecurity, and so forth. It is thusly, fundamental to think about every one of these components as the main priority while getting ready appraisal model.

Retention

As per business word reference, retention is a state of holding something as a primary concern. It is conceivable to retain something in the momentary memory. Retention is actually preserving the capacity of the students for different subject areas. The student learns the things in different ways, like formally in the institution or informally through elders. Now, the different ideas, rules, formulas, precautions all are gathered in the mind. The human mind's capacity is not such to pertain all ideas at a time in the working memory, therefore some ideas by coding process are saved in the long term

memory, while a portion of it is wasted. This portion is more the possession of the individual. The retention is actually what portion of the information, a human being can preserve for a long time. When we hear the telephone number, we try to write it down on some paper, because the number will be lost from memory if we are not able to save it on paper for a few moments. The same is the case with the teaching-learning process.

Retention is an important educational term and the achievement of the students is affected by the retention process. The intelligent can retain the things for a longer period of time due to which they get the best score in the examination, whereas, the poor students can't retain the things for a longer period. This means, this is the actually important thing, which affects the overall results in the school subjects of the students. Similarly, the obligating of the material for a longer period so that it could be easily loaded again in the short term memory is actually retention. This stint is used differently, in different situations and can be spoken in many manners. Retention alludes to the capacities of the individuals to ingest and hold diverse information. Retention is the nature of recollecting and actualizing information. The workers of a decent organization, for the most part, have the degree of retention, particularly high which implies that the representatives can hold significant information and use it advantage the individuals.

Information Communication Technology (ICT)

Pelgrum and Law (2003) express that the articulation "information technology" replaced "computer" toward the end of 1980, which shows a difference in the center from figuring innovations towards putting away and recovering the information. This announcement calls attention to that the computers were utilized uniquely as registering gadgets before the term IT was presented in 1980s. With entry of time, the technology opened new gateways for using it in different ways. The student access was possible for email in 1992 and the expression "ICT" was presented (Pelgrum and Law, 2003).

The "ICT" consists of the many devices which were used in the old days as well as the new technologies that are used in the new ages. The old ICT's were the radio, television and the new ones are a computer, multimedia, programs that are run by computers, the projectors and many mores (United Nations Report, 1999).

"Information Communication Technology" may be viewed as the blend of Technology and the devices for information (UNESCO 2002).

"ICT" in the words of Murray (2011) is the advancement in IT and it additionally includes computers, fundamental programming, etc., for example phone lines and remote signs. (Foldoc, 2008). As indicated by Singh (2013), "ICT" is the arrangement of different assets and innovative devices that are used so as to gather oversee just as communicate the necessary information. This is a definition that covers many things and this is always an alive definition of ICT which covers many ICT in the future and the CT still used these days. Here two articulations are presented, the first is an accumulation of different assets, and the subsequent one is innovative devices. These two articulations incorporate numerous things. This definition covers the majority of the old as well as the new age ICT because it provided the baseline for ICT and no ICT technologies are mentioned by name, yet these articulations spread a great deal. The "ICT" has become a basic piece of individuals' lives in the cutting edge world. In the present current western social orders papers are perused, bills are paid, Companions and family members are in contact, and any sort of information is gotten by means of the web. The technology identified with "ICTs" is broadly used in the field of education for arrangement, association, just as examination of various information. "ICTs" used in the field of education comprises of a wide scope of gadgets, similar to computers, TVs, projectors, realistic, web search tools, electronic mail, tablets, workstations and so on. The joining of "ICT" in the field of education may Positively affect the learning procedure by occupying the concentration from the traditional teacher-loped approach towards the cutting edge student jogged approach. Besides, it offers opportunities to build up the information, thinking resources, different aptitudes of communication, discourse abilities, aptitudes for higher reasoning, critical thinking approach, just as inventiveness (Singh, 2013, Afolabi, 2010).

Here the researcher gives the meaning of the term as well as referenced the utilized of "ICTs" in the cutting edge education framework. A portion of the gadgets is referenced in this definition, however, there are as yet a lot more to specify. It is additionally referenced here that the utilization of "ICTs" may positively affect the learning procedure. This further suggests improvement in the

various resources of the students. Today, as we realize that it is difficult to carry on with an effective existence without utilizing these advanced advances, in this way, it turns out to be particularly imperative to gain proficiency with these fundamental aptitudes, and particularly it is basic for the new age to have a decent grasp on the utilization of "ICTs".

Nowadays the ICT is used in two different ways, one is its utilization as the teaching aids, which is actually the surface use of ICT and not more effective. The second use of IC is the utilization of ICT as the teaching programs like the different programs are built-in for different subject areas and the students' ar instructed through these programs, this is the actual use of computer and the technologies in education, however this needs the expertise of the instructor and the programmer. The role, of the teacher in this type of use of technology is as a guide and not the tutor (Okoro & Ekpo, 2016).

Research Methodology

Research design

The design of the current investigation was an experimental research design. This design is more suitable for the experimental study of this type, in which the researcher wants to investigate the effect of some treatment on something, like in the present study we are investigating the ICT impacts on the retention of the students. In, the experimental design the students are divided into two equated groups for the purpose of experiment and they are given the different types of treatments.

Population

The population on which the present investigation was done can best be illustrated in the table below:

The table indicated that there were 136 students belonging to two different schools of District Dera Ismail Khan. One school GHSS No 4 is a male school, in there were 64 students and the other St. Helen schools which have 72 students at higher secondary level, was a mixed-gender school.

Sampling

A sample of 120 students was selected, in which 60 students were male and the remaining 60 were female. The Roscoe (1975) said that a sample more than 30 participants is sufficient for the studies involving experiments.

Instrumentations

Two instruments were used in the present investigation, one was the achievement test while the second was the retention test in the subject of mathematics of higher secondary school.

Validity and Reliability of the achievement test and retention test

The validity of the test was ensured through the subject teachers of mathematics which were teaching mathematics at higher secondary level. The validity was ensured by filling the questionnaires on three different options, whether the items were appropriate to be included in the test, whether it needs some modification and sentence structuring or it is totally irrelevant and needs to be regretted the test. Similarly, the other major measure was the reliability of the tests, the reliability of the academic achievement tests was 0.92 and the reliability of the retention test was 0.86.

Data Analysis

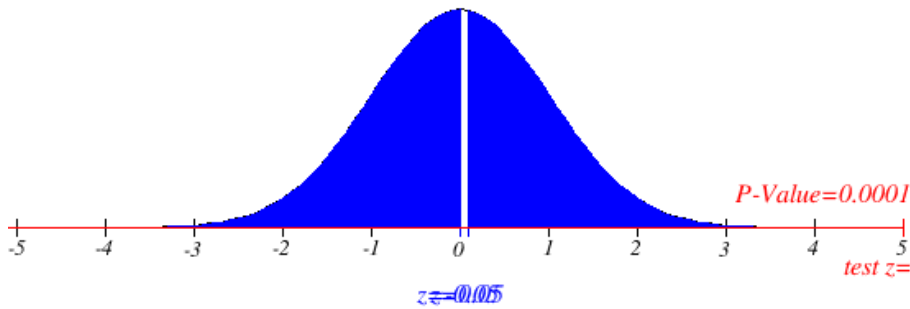
The collected data was first in the paper form, then put to excel and finally it was converted into the SPSS for analysis. The descriptive analysis Mean, df, SD, was done along with the actual inferential analysis, which was done through the t-test because it measures the differences in the two groups of the study.

Data Analysis and Interpretation

Table 1. Achievement Score differences which were checked by the t-test

Variable	N	Mean	SD	t	df	p-value
CG	60	34.54	5.43	5.76	128	.000 *
EG	60	45.66	6.45			

* Significant at 0.05 level

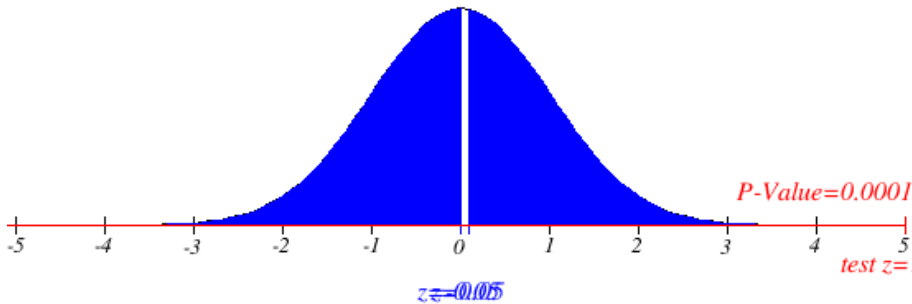


The analysis of data in table 1 above indicated the Mean difference results between the control and the experimental groups on achievement tests. The Mean of both the groups on the academic achievement tests was 34.54 and 45.66 respectively. The inferential analysis of data depicted that the $t=5.76$, at $p= 0.000 < 0.05$, highlighting that a significant difference exists between the groups. The analysis results are in favor of the students who were exposed to the ICT approach.

Table 2. Retention Score differences checked by t-test

Variable	N	Mean	SD	t	df	p-value
CG	60	58.35	12.45	13.31	128	0.000*
EG	60	84.02	8.24			

* Significant at 0.05 level



The above exploration of table 2 above signposted the Mean difference results between the control and the experimental groups on the retention test. The Mean of the groups on the retention tests was 58.35 and 84.02 respectively. The inferential analysis of data depicted that the $t=13.31$, at $p= 0.000 < 0.05$, highlighting that a significant difference exists between the groups. The analytical results are in favor of the students who were experimented with the teaching with ICT instructional approach.

Conclusions

The comparison of the achievement of both the groups indicated that the Mean of the control and the experimental groups on the academic achievement tests was 34.54 and 45.66 respectively. Further, generalizing the results on the overall population indicated that $t=5.76$, at $p= 0.000 < 0.05$, which argues that both the groups were different. This difference was in favor of the experimental group because the Mean of this group was greater as compared to control group (table 1)

The data analysis results for comparing the groups depicted differently on retention. Further, the application of t-test shows that the $t=13.31$, at $p= 0.000 < 0.05$, highlighting that a significant difference exists between the groups. The inquiry resulted in the findings in favor of the experimental group (table 2). The ICT approach is found to be most effective in maintaining retention. Hence, this study is a type of footprint for the researcher who is investigating the ICT effects in different subjects.

Discussion

The current study investigated the effect of ICT instructional approach on academic achievement and retention as

compared to conventional approaches of teaching in mathematics at the higher secondary level. The results depicted that ICT instructional approach was best in enhancing the academic achievement and retaining the achievement. These results are supported by Ruttanathummatee (2004) who investigated the ICT effectiveness at school level. The results are backed by the investigation of Karaoglan et al. (2004) who conducted the study on science subjects. The results are also backed by the study of Naba'h et al., (2009) which is in English Grammar. The studies in Pakistan are very few in the different subject areas using ICT. However, there is no such study, which was conducted in mathematics at a higher grade level in ICT. The studies which are conducted in developed countries are by Liu et al., (2009) and Youssef and Dahmani (2010), which supported the results of this investigation.

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