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# Effectiveness of ICT in teaching of mathematics for ix standard students in Puducherry region

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**Abstract**
Education is referred to any act or experience that has a formulative effect on the personality of an individual. The demands of education vary from time to time. Technology has dominated every aspect of human life. Presently the field of education is highly influenced by the intervention of technology, hence a study was undertaken to ascertain the effectiveness of ICT in teaching of Mathematics for IX standard students in Puducherry region. In order to check the effectiveness, a ICT programme for a selected topic in Mathematics was developed by the investigator and was presented to 50 students under investigation. The findings of the study revealed that there is a remarkable progress in the achievement of the students who were exposed to ICT.

**Keywords:** ICT, mathematics, technology

## Introduction
Nowadays the role of Information and Communication Technology (ICT) in the education sector plays an important role, especially in the process of empowering the technology into the educational activities. Education sector can be the most effective sector to anticipate and eliminate the negative impact of ICT. Technology in another side can be the most effective way to increase the student's knowledge.

Being aware of the significant role of ICT in our life, especially in the educational activities, education authorities should be wise enough in implementing the strategies to empower ICT in supporting the teaching and learning process in the classroom. ICT is not just the bloom of the educational activities, but also it will be the secondary option to improve the effective and meaningful educational process.

According to the report of Indian Education Commission (1964-66), education ought to be related "to the life, needs and aspiration of the people" and thereby made powerful instruments of social, economic, and cultural transformation". Due to the scientific and technological progress, there has been a great explosion of knowledge during the last few decades. The explosion of knowledge has raised the serious questions of both quality and quantity of education, but this is not possible with mere book learning, hence technology paves way. ICT could bring significant changes in education from the individual sphere to the most socio- economic structure. ICT has a long history in education. ICT enables the entire traditional teaching and learning process to be redeveloped replacing the lecture absorb test mode and bringing about the mega change in every felid of education. It is helpful in improving learning times and retention considerably over many traditional approaches. There are anecdotal evidences that ICT works much quicker. It brings about change in quality, experience and accessibility of education. ICT will undoubtedly open up new opportunities for educational activity and new forms of delivery. ICT will provide a vehicle for exploring more comprehensively than hitherto the learning process and its ingredients.

## Significance of the study
An appropriate educational technology in the hands of the competent teacher can ensure better teaching –learning process. When pupils learn through different senses, their understanding becomes smoother and inquisitive. Instruction through ICT is a good technique in that direction. Since Mathematics requires more understanding, it is acquired through this technique.

ICT can penetrate more deeply into the development of human cognitive system with an immediate excitement than any other medium. Different process can be shown with ease. Inaccessible places can be viewed sitting in the classroom.

Different ICT tools and accessories are tools to supplement the method of teaching and will give a rich background to make teaching a memorable one. They will motivate the people to attain the desired level of learning.

It becomes an utter waste for a Mathematics teacher to make the pupils understand the concept which is already abstract, by mere traditional method. Hence video and audio plays an effective role here. This paves way for ICT teaching in Mathematics in narrow sense and all subjects generally.

## Objectives
1. To study the effectiveness of ICT approach over the conventional method in teaching of Mathematics for IX standard student.
2. To develop a ICT programme for teaching of Mathematics for IX standard students.

## Limitations
The population chosen is restricted to 60 students of standard IX.

## Hypothesis
1. There is no significant difference between the achievements of experimental group and control group in the pre- test.

2. There is no significant difference between the achievements of experimental group and control group in the post- test.
3. There is no significant difference between the achievements of control group in the pre-test and post- test.
4. There is no significant difference between the achievements of experimental group in the pre-test and post- test.

**Method of study**
Experimental method was adopted for the investigation under study.

**Tools used**
1. Pre-test on the selected topic developed by the investigator.
2. ICT programme to teach the experimental group.
3. Achievement test on the selected topic developed by the investigator.

**Sample**
Sample comprised of 60 students from IX standard of Sri Sampouna Vidhyalam Higher Secondary School, Puducherry.

**Statistics used**
For analyzing the data mean, standard deviation (Descriptive analysis) and t-test (Differential analysis) was used.

**Results and discussion**
The effectiveness of ICT will be discussed with the relevant tables in the following section of study.

**Descriptive Analysis**

**Table 1:** Showing mean and standard deviation of control group in pre-test and post-test

| Category | Number of Students | Pre-Test | | Post -Test | |
|---|---|---|---|---|---|
| | | Mean | Standard Deviation | Mean | Standard Deviation |
| Control Group | 30 | 63.60 | 14.42 | 65.92 | 14.07 |

**Table 2:** Showing mean and standard deviation of experimental group in pre-test and post-test

| Category | Number of Students | Pre-Test | | Post -Test | |
|---|---|---|---|---|---|
| | | Mean | Standard Deviation | Mean | Standard Deviation |
| Experimental Group | 30 | 63.93 | 11.56 | 87.90 | 6.33 |

**Differential Analysis**
**Hypothesis-1**
There is no significant difference between the achievements of experimental group and control group in the pre- test

**Table 3:** Mean difference between the Experiment group and Control group in their Pre-test.

| Category | Number of Students | Mean | Standard Deviation | T' Value |
|---|---|---|---|---|
| Control Group | 30 | 63.60 | 14.42 | 0.0838 |
| Experimetal Group | 30 | 63.93 | 11.56 | |

It is inferred from table 3 that the calculated 't' value between the experimental group and the control group with respect to their achievement in the pre-test and the post-test is lower than the table value at 0.05 level of significance. Therefore the null hypothesis is accepted.

Hence there is no significant difference in the achievement of experimental and control group in the pre-test.

**Hypothesis-2**
There is no significant difference between the achievements of experimental group and control group in the post- test

**Table 4:** Mean difference between the experimental group and control group in the post- test

| Category | Number of Students | Mean | Standard Deviation | 'T' Value |
|---|---|---|---|---|
| Control Group | 30 | 65.92 | 14.07 | 6.791 |
| Experimetal Group | 30 | 87.90 | 6.33 | |

It is inferred from table 4 that the calculated 't' value between the experimental group and the control group with respect to their achievement in the post-test is higher than the table value at 0.05 level of significance. Therefore the null hypothesis is rejected.
Hence there is significant difference between the achievement of experimental and control group in their achievement in post-test.

**Hypothesis-3**
There is no significant difference between the achievements of control group in the pre-test and post- test

**Table 5:** Mean difference between the control group in their achievement between the pre-test and post-test

| Category | Number of Students | Mean | Standard Deviation | 'T' Value |
|---|---|---|---|---|
| Pre-Test | 30 | 63.60 | 14.42 | 0.464 |
| Post-Test | 30 | 65.92 | 14.07 | |

It is inferred from table 5 that the calculated 't' value of the control group with respect to their achievement in the pre-test and post-test is lower than the table value at 0. 05 level of significance. Therefore the null hypothesis is accepted.
Hence there is no significant difference between the achievement of control group in pre-test and post-test.

**Hypothesis-4**
There is no significant difference between the achievements of experimental group in the pre-test and post- test

**Table 6:** Mean difference between the experimental group in their achievement between the pre-test and post-test

| Category | Number of Students | Mean | Standard Deviation | 'T' Value |
|---|---|---|---|---|
| Pre-Test | 30 | 63.93 | 11.56 | 9.423 |
| Post-Test | 30 | 87.90 | 6.33 | |

It is inferred from table 6 that the calculated 't' value of the experimental group with respect to their achievement in the pre-test and post-test is higher than the table value at 0. 05 level of significance. Therefore the null hypothesis is rejected.
Hence there is significant difference between the achievement of control group in pre-test and post-test.

**Findings**
1. There is no significant difference between the achievements of experimental group and control group in the pre- test
2. There is significant difference between the achievements of experimental group and control group in the post- test.
3. There is no significant difference between the achievements of control group in the pre-test and post- test
4. There is significant difference between the achievements of experimental group in the pre-test and post- test

**Discussion and conclusion**
This experimental study reveals that there is as significant difference in the achievement of the experimental group over control group of IX standard students in Mathematics due to exposure of ICT based learning to the experimental group. Thus ICT helps the students to withstand their interest and also their retention power than the traditional method of teaching. It also creates fun and friendly method of learning without fear of failure.
Therefore, ICT programme should be developed for all subjects. The Constant use of ICT will make students understand and retain effectively the concepts and will give rise to higher academic achievement.
Hence it is concluded with 99 percent confidence that the ICT approach is considered to be one of the best techniques for mathematics teaching at IX standard level.

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