Abstract

In the present study researchers tried to study the effectiveness of Information and Communication Technology on primary school students and ascertain relationship between effectiveness of ICT and Academic Performance of Govt. primary school students with respect to gender and type of teaching. Experimental method was used for the study. The sample of the study was 240 students from 8 govt. schools from 2 different talukas of Shivamogga District. Two homogenous groups were formed randomly for the study and the effects of independent variables were tested under experimental conditions. Raven's progressive matrices intelligence scale was used to determine the homogeneity of the participants. After one month, the delayed post-test for achievement in science was administered to determine the retention level of the students. The statistical techniques used to analyze the data were the independent sample t-test and paired sample t-test. The findings indicated that as far as the overall achievement in science, retention of knowledge, comprehension, application, and skills are concerned, the ICT-based method of teaching of science was more effective than the conventional method of teaching. The effects of gender varied according to comparisons.
1. Introduction

According to thinkers and educationists, education is the ‘third eye’ of a person. It gives him insight into all affairs. It teaches him how to act justly and rightly. It leads him to realize the true significance of life. It removes darkness and shatters illusion. Education increases our fame. It makes us cultured and pure. Education nourished us like a mother. It directs us to the proper path, it guides us to reach our destination. Technology is means for making major improvements in education. The improvement takes place when one uses the technology with maturity and competency. Information and Communication Technology (ICT) is being considered as the technology of having far-reaching consequences in the field of education wherein the whole concept of transactional principles and the focus undergo a change in respect of centeredness of education towards child and learning principles, its effect and efficacy. It is being brought out through researches that ICT provide scope for opening new sources of information and empowers the individual for sustained self-learning at his own pace which does not strain the individual.

2. Significance Of The Study

ICT has brought revolution in education field. ICT is widely used effectively in current education system all over the world. Computer multimedia is one of the effective medium to impart education and it has become a buzzword in Indian education system. Government and private stakeholders of education are giving utmost priority to introduce computer education in the daily classroom teaching. So it is very necessary to conduct such type of research which will give clear idea of effectiveness of ICT on primary school students and its perceived impact on their academic performance.

3. Statement Of The Problem

“Effectiveness of ICT based science teaching on academic achievement of primary school students.”

4. Operational Definitions Of Technical Terms

i. **Primary School Students:** With reference to the present study, “Primary School Students are those “Students who study in 5-7th standard in any type school.”

ii. **Science Teaching:** In accordance with this research, Science Teaching is defined as, “Classroom teaching of the sciences that deals with science syllabus prescribed by the DSERT Karnataka.”

iii. **ICT based Science Teaching:** In this research, ICT based science teaching can be defined as, “Classroom teaching of Science (physics, chemistry & biology) that deals with science syllabus prescribed by the DSERT, Karnataka using technologies such as radio, television, satellite systems & computer with relevant software’s, hardware & network with advanced equipment.

iv. **Academic Achievement:** It means that the achievement of a student done in a school, college or higher education level in terms of tests, examinations which is the criterion for the performance of the student.

v. **Conventional Method:** Conventional method of teaching means communicating information through lectures to students, consisting of explanation interspersed with teacher’s questions and student’s answer.
5. Objectives Of The Study
   I. To develop ICT based programme for teaching science to 7th standard students.
   II. To study the ICT enabled teaching learning process in rural government primary schools of Thirthahalli and Sagara Taluk.
   III. To study the effectiveness of ICT based programme for teaching science subject in 7th standard students in government primary schools of Thirthahalli and Sagara Taluk in terms of academic achievement for the I semester.
   IV. To study the extent of effectiveness of ICT based programme for teaching science subject in 7th standard students in government primary schools of Thirthahalli and Sagara Taluk during I semester.

6. Research Hypothesis Of The Study
   I. There is no significant difference between the mean scores of pre-test and post-test on academic achievement in science of the control group among 7th standard government primary school students of Thirthahalli and Sagara Taluk.
   II. There is no significant difference between the mean scores of pre-test and post-test scores on academic achievement in science of the experimental group among 7th standard government primary school students of Thirthahalli and Sagara Taluk.
   III. There is no significant difference between the mean scores of pre-tests on academic achievement in science of the control group and experimental group among 7th standard government primary school students of Thirthahalli and Sagara Taluk.
   IV. There is no significant difference between the mean scores post-tests on academic achievement in science of the control group and experimental group among 7th standard government primary school students of Thirthahalli and Sagara Taluk.
   V. There is no significant difference between the mean scores of post-test and delayed post-test on academic achievement in science of the control group and experimental group among 7th standard government primary school students of Thirthahalli and Sagara Taluk.

7. Design Of The Study
   The study was conducted by Pre-test, Immediate Post-test and Delayed Post-test design.

   Table 8.1: Showing the Design of the Study

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-Test</th>
<th>Treatment</th>
<th>Post-test</th>
<th>Delayed Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>✓</td>
<td>X₁</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Control Group</td>
<td>✓</td>
<td>X₂</td>
<td>✓</td>
<td>X</td>
</tr>
</tbody>
</table>

   X₁ → ICT Based Teaching
   X₂ → Conventional Method of Teaching

8. Methodology Of The Study
   The present study employed experimental method. It aimed at studying and describing the ICT effectiveness and its perceived impact on Academic Performance of the 7th standard students using randomized parallel group design.
8.1 Sample Of The Study

For the present study 240 students of 7th standard studying in rural govt. primary schools were selected. These students were selected randomly from the schools across Thirthahalli and Sagara Taluk Jurisdiction.

8.2 Variables Of The Study

The present study constitutes the following variables:

I. Approaches of Teaching Science (Specially Designed Multimedia Programme and Conventional Method) are independent variable.

II. Achievement in Science is dependent variable.

8.3 Tools Used In The Study

The following tools were used in the present study for the purpose of collecting the data.

A) ICT Based Teaching Programme:

The tool administered for the purpose of data collection was ICT programme designed to see the improvement in academic achievement of students in learning science developed by the investigator.

B) Achievement test: Achievement test has been conducted by the investigator as pre-test and post-test on two group to study the effectiveness of treatment. The test is of 40 marks of Multiple Choice type Questions in which equal weightage was given to the objectives, content and difficulty level. There is no negative scoring for wrong answers.

9. Results And Analysis Of The Data

For the Descriptive Analysis the data was analyzed using the measures of central tendency, variability and normality like Mean and Standard deviation. For the Inferential Analysis the hypotheses were analyzed using the appropriate statistical techniques like independent sample t-test and paired sample t-test. The hypotheses were tested and interpretation was done as follows.

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t value</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>H1</td>
<td>Control</td>
<td>Pre-test</td>
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<td>24.35</td>
<td>6.77</td>
<td>0.712</td>
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<td>6.05</td>
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<td>Pre-test</td>
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<tr>
<td>H1</td>
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<td>4.52</td>
<td></td>
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<tr>
<td>H3</td>
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<td>6.77</td>
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<td>H3</td>
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<td>Experimental</td>
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</tbody>
</table>

Interpretations

- There is no significant difference between pre-test and post-test control group. (t =0.712, P<0.01). Thus it can be interpreted that, conventional method of teaching doesn’t cause any kind of effectiveness in the academic achievement of students.
There is a significant difference between pre-test and post-test experimental group. (t =11.835, P<0.01). This indicates that the ICT based teaching program used in experimental group was effective after providing successful treatment.

There is no significant difference between pre-test control and experimental group. (t =0.779, P<0.01). Thus it can be interpreted that, the groups were approximately equal (homogeneous) to each other.

There is a significant difference between post-test control and experimental group. (t =9.305, P<0.01). This indicates that the ICT based teaching program used in experimental group was effective after providing successful treatment.

There is a significant difference between post-test and delayed post-test experimental group. (t =2.69, P<0.01). This indicates that the ICT based teaching program used in delayed post-test experimental group was effective even after some period of time.

Figure 9.1: Graph showing the mean achievement test scores in science of Pre-test, Immediate Post-test and Delayed Post-test in first semester.

From the above graph it can observed that,

- No difference in mean achievement scores of the pre-test, post-test control group and pre-test control and experimental group.
- Significant difference in mean can be seen in the mean achievement scores of the pre-test, post-test experimental group and post-test control and experimental group and post-test and delayed post-test experimental group.
10. Conclusion

The results of the present study indicate that both the approaches (ICT and Conventional Methods) are effective in increasing the academic achievement. But the effectiveness is not unifactor; it should consider the extent of effectiveness and the sustainability of the effectiveness. The results clearly show that the ICT is more effective than the conventional method in increasing the academic achievement of students in science subject. Further the delayed post test results confirm the sustained effectiveness of the ICT in terms of academic achievement. Hence, the present study helps the teachers to think of adapting ICT in teaching learning process. ICT based teaching is successful in nurturing of different teaching-learning environment helping students to improve the acquiring of information, ideas, skills, decisions, responsibilities, Judgments, values, ways of thinking, means of expressing themselves and content knowledge. It is further necessary to train the teachers to use this method of teaching for enhancing the effectiveness of their teaching which creates a conductive learning environment of science subject.

References