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**Effectiveness of Activity Based ICT (Information and Communication Technology) Strategies  
in Development of Professional skills, Knowledge and Understanding and Attitude among  
Secondary School Teacher Trainees**

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**Abstract**

In twenty first century education is based on child centered education. Hence all the teacher must should prepare to cope with different technology for using them in the classroom for making teaching-learning more interested. Activity based Information and Communication Technology strategies has enabled better and effective communication. It is an effective tool for information acquiring thus students are encouraged to look for information from multiple sources and they are now more informed than before. It is natural that in teacher-education must include new activity-based Information and Communication Technology strategies. Teachers should also know the right attitudes and values besides being proficient in professional skills related to teaching. Review made by the researcher in the clarified that certain projects and strategies were developed for activity-based ICT teaching-learning strategies in primary and secondary level of education, but effectiveness of activity-based ICT strategies in development of professional skills among student-teachers, that wasn't ever experimented by any researcher. Hence the researcher felt that developing an activity-based ICT teaching-learning strategy in B.Ed. course could be a substantial solution for the problems in developing ICT teaching-learning skills among student-teachers and also to know its impact on their professional skill, knowledge and understanding and attitude among student-school teacher.

*Keywords:* activity-based ICT strategies, professional skills, knowledge, understanding, attitude, and student-teachers

## **Introduction**

Teachers are the most essential component in the field of educational system, teachers should prepare to keep up with information and communication technology utility in the classroom. Activity-based ICT is not only an essential tool for teachers in their tasks, but also provide them opportunities for their own professional development. In conventional method of teaching most of the time is consumed for the input output and less time left for the process. But in teaching with activity-based ICT strategies the input and output time is reduced and process time is increased. When the process time is increased, time of learner's activities, discussion, correlation with other subjects, brainstorming, learning, etc., will increase.

Teachers' professional development is absolutely essential if technology provided to schools is to be used effectively. Simply put, spending scarce resources on information technology hardware and software without financing teachers' professional development as well is wasteful. All around the world in developing, industrialized, and information-based countries has shown that teacher training in the use and application of technology is the key determining factor for improved student performance.

## **Professional Skills for Teachers**

Teachers need to be adequately prepared to implement a state-of-the-art ICT curriculum. Indeed introducing any new curriculum calls for careful preparation, management, resourcing, and continuing support. In the case of an ICT curriculum, even more concerns have to be considered.

Educational research studies show that programs of professional development for teachers are most effective if directed to the stage of ICT development reached by schools.

### **Objectives of the Study**

1. To study the effectiveness of Activity Based ICT strategies in the development of knowledge of ICT among student-teachers with respect to gender.
2. To study the effect of Activity Based ICT strategies and attitude among secondary school teacher trainees with respect to stream.
3. To study the effect of Activity Based ICT strategies and attitude of secondary school teacher trainees in relation to gender.
4. To study the effect of Activity Based ICT strategies and attitude of secondary school teacher trainees in relation to stream.
5. To study the effectiveness of Activity Based ICT strategies in development of professional skills among secondary school teacher trainees in relation to gender.

### **Hypotheses of the Study**

1. There is no positive and significant relationship between Activity Based ICT strategy and professional skills among student teachers in relation to gender.
2. There is no positive and significant relationship between Activity Based ICT strategy and professional skills among student teachers in relation to stream.
3. There is no significant relationship between Activity Based ICT strategy and knowledge among student teachers in relation to gender.

4. There is no significant relationship between Activity Based ICT strategy and knowledge among student teachers in relation to stream.
5. There is no significant relationship between Activity Based ICT strategy and understanding among student teachers in relation to gender.

### **Research Design**

The study was experimental in nature. The research design suitable for this type of research study is found to be pre-test and post-test experimental group and control group design also known as 'Equivalent Group Design'. This design was found to be most appropriate after review of literature of experimental design.

### **Population of the Study**

The present study focused on 50 samples in two groups. Experimental group and Control group. Conventional method approach was used in control group; Activity based ICT strategy was used in experimental group. Each group consist both male and female, and arts and science stream of secondary school teacher trainees. The study consists 25 secondary school teacher trainees in control group (18 female and 7 male student teachers) and 25 teacher trainees in experimental group (18 female and 7 male student teachers).

The researcher followed purposive sampling technique to select the student-teachers. The study was confined to the secondary school trainees in studying CBCS two years B.Ed. degree. The investigator limited the study to only one aided college in Bangarpet Taluk. A suitable college was selected as per the requirements of the researcher to make the study feasible.

Following facts were taken into consideration while selecting suitable sample for the experimental study.

The readiness, total agreeability and complete co-operation of the head the institution and the wholehearted consent of staff members.

Punctuality and regularity on the part of the students was expected.

Availability of flexibility of time schedule.

### **Experimentation**

In experimental studies the researcher is manipulating the treatment so the problems of extraneous variables causing a relationship is less strong in experimental research than in any other type of research because the experimenter can control the environment and ensure that as few extraneous factors are involved as possible. One approach to the issue of the relation between the quality of design and implementation and study's result in to investigate the matter empirically (Cooper and Valentine, 2001). Randomization process helps to avoid bias in selection of the subjects for there is exactly equal chance of being in experimentation.

#### **Phase1: Administration of Pre-test**

The investigator selected one aided B.Ed. College in Bangarpet taluk, Kolar district. There are 50 B.Ed. student-teachers in first years and 47 in second years B.Ed. The investigator selected 1<sup>st</sup> year 50 B.Ed. trainees (second semester) chosen for the research and in that 25 B.Ed. student-teachers in experimental group and 25 B.Ed. students in control group. The investigator equally randomized both the groups before assess the pre-test of control and experimental group's achievement in 'learning and teaching'.

## **Phase 2: Conducting the Experiment**

The student-teachers were distributed into one experimental group and one control group for treatment as given below,

Activity based ICT strategy was adopted for the experimental group and conventional method of teaching was followed in the control group of student-teachers. Teaching was carried out for a period of approximately one month period each for experimental group and control group.

## **Phase 3: Administration of Post-test**

After the completion of treatment, post-test was administered for both experimental group and control group, on the dimensions of professional skills, knowledge and understanding. The attitude towards Activity based ICT strategy among student-teachers was also carried out.

## **Phase 4: Delayed Post-test Administration**

After one month gap of the treatment the investigator has conducted delayed post-test to the experimental group maintaining a break of one month in the same dimensions to confirm the sustenance of the concepts and skill taught to them through activity-based ICT strategy, among student-teachers to ascertain the effectiveness of activity-based ICT strategy.

## **Statistical Techniques Used in the Study**

The obtained data are analyzed by using appropriate statistical techniques such as

Descriptive statistics, independent sample t test, paired sample t test, and Cronbachs alpa.

H<sub>0</sub>: There is no significant difference in the Post-test scores of Activity based ICT teaching strategy between control group and experimental group.

H<sub>1</sub>: There is a significant difference in the Post-test scores of Activity based ICT teaching strategy between control group and experimental group.

### Paired Samples Test

Post test scores of	Paired Differences					f	Sig. (2-tailed)	
	Mean	Std.	Std.	95% Confidence				
		Deviation	Error	Interval of the				
		n	Mean	Difference				
				Lower	Upper			
Experimental vs. Control group	1.080	10.440	2.088	66.771	75.389	4.042	4	.000

### Interpretation:

From the above data it is clear that there were 25 students who took control group post-test and 25 students who took part in experimental group post-test. A paired sample t-test was run to determine if there were differences in control group post test scores and experimental group post test scores of students. Mean of experimental group post-test ( $211.04 \pm 7.092$ ) is slightly higher than the mean of control group post-test ( $139.96 \pm 7.877$ ). Hence a statistically significant difference of 71.08 (95% CI 66.771 to 75.389),  $t(24) = 34.042$ ,  $p = 0.000$  was observed. Hence null hypothesis; there is no significant difference in the Post-test scores of Activity based ICT teaching strategy



between control group and experimental group is rejected and the alternative hypothesis is accepted.

*Showing the t-test result between Experimental and control group post-test scores of Attitude towards Activity based ICT Teaching strategy*

Post test scores of	Paired Differences				f	Sig.
	Mean	Std.	Std.	95%		
		Deviation	Error	Confidence		
	n	Mean	Interval of the	Difference		
			Lower	Upper		
Experimental vs.	9.652	1.930	42.216	50.184		
Control group	6.200				3.932 4	000

### Interpretation

From the above data it is clear that there were 25 students who took control group post-test and 25 students who took part in experimental group post-test. A paired sample t-test was run to determine if there were differences in control group post test scores and experimental group post test scores of students. Mean of experimental group post-test ( $156.32 \pm 5.786$ ) is slightly higher than the mean of control group post-test ( $110.12 \pm 7.949$ ). Hence a statistically significant difference of 46.200 (95% CI 42.216 to 50.184),  $t(24) = 23.932$ ,  $p = 0.000$  was observed. Hence null hypothesis; there is no significant difference in the Post-test scores of Activity based ICT teaching strategy between control group and experimental group is rejected and the alternative hypothesis is accepted.

H<sub>0</sub>: There is no significant difference in the Post-test scores of Professional skills towards Activity based ICT teaching strategy between control group and experimental group.

H<sub>1</sub>: There is a significant difference in the Post-test scores of Professional skills towards Activity based ICT teaching strategy between control group and experimental group.

*Showing the statistics of Post-test scores of Professional skills towards Activity based ICT teaching strategy between Experimental and control group.*

Post test scores of		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Experimental group	18.36	25	1.319	.264
	Control group	9.80	25	1.291	.258

Post test scores of	Paired Differences					t	f	Sig. (2-tailed)
	Mea n	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Experimental vs. Control group	9.24 0	1.786	.357	8.503	9.977	25.86 7	24	.000

### Interpretation

From the above data it is clear that there were 25 students who took control group post-test and 25 students who took part in experimental group post-test. A paired sample t-test was run to determine if there were differences in control group post test scores and experimental group post

test scores of students. Mean of experimental group post-test ( $18.36 \pm 1.319$ ) is slightly higher than the mean of control group post-test ( $9.12 \pm 1.364$ ). Hence a statistically significant difference of 9.240 (95% CI 8.503 to 9.977),  $t(24) = 25.867$ ,  $p = 0.000$  was observed. Hence null hypothesis; there is no significant difference in the Post-test scores of Activity based ICT teaching strategy between control group and experimental group is rejected and the alternative hypothesis is accepted.

### **Statistical Techniques Used in the Study**

After the data had been collected, it was processed and tabulated using Microsoft Excel-2010 Software. The data collected on pretest and post scores of secondary school trainees studying in Gold Field College of Education in experiment and control groups approach. Also, data were collected on activity-based ICT strategy in development of professional skill, knowledge and understanding and attitude scores of secondary school trainees studying in Gold Field College of Education in experiment and control groups. Then the data were analyzed with reference to the objectives and hypotheses by using differential analysis including descriptive statistics, and Cronbachs Alpha, independent t-test, dependent t-test, and Levene's Test for Equality of Variances, using SPSS 20.00 version statistical software and the results obtained thereby have been interpreted.

The obtained data are analyzed by using appropriate statistical techniques such as Independent sample t test, paired sample t test Cronbachs alpha and descriptive statistics.

Mean, Standard Deviation, t-test, f-test

### **Major Findings of the Study**

It is found that the present study reveals that the student teachers have favorable attitude towards Activity based ICT teaching strategy in their subjects.

It is found that there is significant difference between Activity based ICT strategy and knowledge of student teachers and also influence the Attitude towards using activity based ICT strategy among secondary school teacher trainees.

It is found that there is a significant relationship between Attitudes towards activity based ICT teaching strategy and Understanding.

It is found that, there is a significant difference in the post-test scores of Activity based ICT teaching strategy between control group and experimental group. Mean of experimental group post-test ( $211.04 \pm 7.092$ ) is slightly higher than the mean of control group post-test ( $139.96 \pm 7.877$ ). Hence, a statistically significant difference of 71.08.

It is found that there is a significant difference in the post-test scores of Attitude towards Activity based ICT teaching strategy between control group and experimental group, mean of experimental group post-test is slightly higher than the mean of control group post-test. Hence, a statistically significant difference was observed.

It is found that there is a significant difference in the post-test scores of professional skills towards activity-based ICT teaching strategy between control group and experimental group. There were differences in control group post-test scores and experimental group post-test scores of student teachers. Mean of experimental group post-test is slightly higher than the mean of control group post-test. Hence, a statistically significant difference was found.

It is found that post-test scores of knowledge towards activity based ICT teaching strategy between control group and experimental group significantly higher as compared to pre-test scores of knowledge towards activity based ICT teaching strategy.

It is found that there is a significant difference found between pre-test and post-test scores of activity based ICT teaching strategy in experimental group. Mean of experimental group post-test is slightly higher than the mean of control group post-test.

It is found that there is a significant difference between pre-test and post-test scores of Attitude towards activity based ICT teaching strategy in experimental group is slightly higher than the mean of control group pre-test and post-test scores. Hence, a statistically significant difference was observed.

There is a significant difference found between pre-test and post-test scores of professional skills towards activity-based ICT strategy in experimental group,

It is found that there is a significant difference between pre-test and post-test scores of knowledges towards activity-based ICT teaching strategy in experimental group.

It is found that there is a significant difference between pre-test and post-test scores of understandings towards activity based ICT teaching strategy in experimental group. Hence, null hypothesis is rejected and alternative hypothesis is accepted.

It is found that there was no significant difference in experimental group post-test scores of activity-based ICT teaching strategy between science stream and arts stream students. Mean and standard deviation scores of science stream students are found to be 210.00 and 6.766 respectively. Mean and standard deviation scores of arts stream students are found to be 211.73 and

7.450 respectively,  $t=0.591$ ,  $p>0.05$  at 5% level of confidence. Hence, the null hypothesis is accepted.

### **Educational Implications**

Based on the discussion of the findings of the study, the following implications could be drawn.

ICT enables the transformation of teaching, research and learning process at all levels. It empowers teachers and students, making significant contributions to the education.

ICT as a medium for teaching and learning in 21<sup>st</sup> century is an era of information and communication technology (ICT). The various approaches of activity based ICT strategy such as collaborative, team teaching, cooperative teaching, learning together strategy, and computer based learning; computer assisted instruction etc, but in educational training institutions the use of ICT strategy in practically are very less.

Teacher educators should be trained properly to integrate activity based ICT teaching strategy in their teaching subjects.

Activity based ICT teaching strategy helps to develop professional skills, knowledge and understanding among student teacher.

Teacher educators in B.Ed. colleges should be given free and compulsory use of ICT strategies to student teachers in their practice in teaching time, it enables them to use new strategies in their teaching.

Use of activity-based ICT teaching strategies in develops professional skills, training centers knowledge and understanding among student teachers.

Activity based ICT strategies help students to understand abstract and complicated concepts of different papers better without the help of the teacher educators, particularly student teachers of individual differences.

Activity based ICT strategies makes teaching techniques for more effective than those the traditional teaching methods as it is used for presenting information, testing and evaluation. It makes a contribution of education.

Student teachers in professional course of B.Ed. should be trained properly to integrate activity based ICT strategies in their teaching practice period and then their daily classroom processes.

Teacher educated should be motivated to incorporate activity-based ICT teaching-learning strategies to develop their professional skills among secondary school teacher trainees.

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