



Impact of the Teaching Strategies on the Achievement of the Student Teachers in Information Technology

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Abstract:

We are not living in the Science age but in the Information technology age. No doubt, Science has influenced a lot on the Information Technology, but it is now considered as Separate field. It is also true that progress of Information Technology (IT) depends upon the application of Science in this field. It is a fact that no field of the universe is there but influenced by Information Technology. Right from the birth to the death of the person, Information Technology follows her/him. So much impact of the same is seen on the education system also. The concept of the class-room has changed dramatically. We can bring the whole world in small class-room with the help of World Wide Web (WWW). New terms like virtual Class-room, Computer Assisted Instruction (CAI), Computer Managed Instruction (CMI) etc. have emerged due to the application of Information Technology in teaching learning process. At the same time its impact is reflected in the syllabus of teacher training programme also. Computer in Education was introduced in the B.Ed course as an optional subject in the Gujarat University before twenty years. With the advent of information Technology, so many changes have been made in the syllabus of the same since then. Nowadays this subject is called "Information Technology in Education" in the Gujarat University. Its syllabus is divided in two parts and both have been given equal weightage. The parts are Theory and Practical. In our college all the student teachers select this subject from the group of the elective subjects. I have applied various strategies to enable the student teachers work on the computer effectively. But I found that the Demonstration and Online teaching method have given me better result. But to find out the better of these two strategies I have decided to know the impact of these two on the achievement of the student teachers.

1. Objectives

The following objectives were kept in mind for the study:

1. To study the impact of the faulty on the achievement of the student teachers in Information Technology.
2. To study the impact of the teaching strategies on the achievement of the student teachers in Information Technology.
3. To study the impact of the sex on the achievement of the student teachers in Information Technology.
4. To study the impact of the interaction between Faculty and the Teaching Strategy on the achievement of the student teachers in Information Technology.
5. To study the impact of the interaction between Faculty and sex on the achievement of the student teachers in Information Technology.
6. To study the impact of the interaction between strategy and sex on the achievement of the student teachers in Information Technology.
7. To study the impact of the interaction among, Teaching strategy and Sex on the achievement of the student teachers in Information Technology.

2. Importance of the Study

Now, Most of the teacher training institutes offer Information and Technology (IT) as a special subject to their trainees and we know that in the teacher training institutes trainees come from all three main

faculties say Arts , Science and Commerce. The findings of this study will ascertain that whether the Teaching Strategy, Sex or the Faculty of the student teachers affected their achievement in Information Technology or not and will provide the guidelines to the teacher educators to concentrate on the student teachers, who are comparatively low achiever.

3. Limitations of the study

The following are the limitation of the study.

1. This study is exclusively meant for the student teachers of the Ahmedabad.
2. Only two B.ed colleges were selected for the study.
3. The student teachers were taught IT according to the syllabus prescribed by the Gujarat University.
4. Only the principal part of the subject is taught for this study.

4. Hypotheses

Ho₁ There will be no significant difference between the mean achievement scores of Science, Arts and Commerce student teachers in Information Technology.

Ho₂ Mean achievement scores of the Student teachers who were taught by demonstration method of by online method will not differ significantly.

Ho₃ Mean achievement scores of Male and Female will not differ significantly.

Ho₄ There will be on significant effect of interaction between Faculty and Teaching strategy on the mean achievement scores of the student teachers.

Ho₅ There will be on significant effect of interaction between Faculty and sex on the achievement scores of the student teachers.

Ho₆ Interaction between Teaching Strategy and Sex will not affect the mean achievement scores of the student teachers.

Ho₇ There will be on significant effect of interaction between variables on the achievement scores of the student teachers.

5. Variable

Three independent variables 1.Faculty, 2.Teaching Strategy and 3. Sex were considered for the study and the dependent variable was the achievement of the student teachers in Information technology. Faculty of the student teachers has three levels like 1.Science, 2.Arts and 3.Commerce,when Teaching Strategy has two levels like 1.Demonstration 2.Online and sex has two levels like 1.Male and 2. Female.

6. Research Method

Experiment method was used for the study for which the student teachers of both the colleges selected for the study were taught IT by different method as mentioned below through out the year.

1. Demonstration method : In this method all the working of the computer is Projected on 16 mm screen with the help of LCD (Liquid Crystal Display) panel, Computer and OHP (Over Head Projector).The steps of the working on the computer is discussed while demonstrating and at last students are asked to write the steps. Then they are allowed to do their practical.
2. Online Teaching method: First of all we will see what does online mean. Online is pertaining to equipment, devices and process that are in direct communication with the central processing unit of a computer.

In this method all the students sit against the computer and do the practical exercise directly according to the instruction given by the teacher. For this study all the computers are connected to the LAN (Local Area Network).Teacher gives the instruction to the students through the network. If any query occurs,the student will ask the teacher and teacher will open the file student on the server and give the instruction to the students.

7. Sample

Two B.Ed. colleges affiliated to the Gujarat University and situated in Ahmedabad were selected for the study. All the students have selected Information Technology as an elective subject that is taught as paper VII in B.Ed. course in Gujarat University. Out of these two colleges one has 105 Student teachers and another has 112 student teachers. Thus total 217 student teachers were selected as sample for the study.

Table 1 Sample of the study

Faculty A	Science A1				Commerce A1				Arts A2			
	Demo. B1		Online B2		Demo. B1		Online B2		Demo. B1		Online B2	
Sex C	Male C1	Female C2	Male C1	Female C2	Male C1	Female C2	Male C1	Female C2	Male C1	Female C2	Male C1	Female C2
No.of St.Teacher s	18	14	10	17	13	11	8	16	23	26	38	23
Subtotal	32		27		24		24		49		61	
Total	59				48				110			
Grand Total	217											

As shown in the table, there are only 8 male student teachers in Commerce faculty taught by online method, it was decided to select 8 student teachers randomly in each stratum. So finally there were 96 student teachers in the sample.

8. Statistical Method

A 3x2x2 factorial design was adopted for the calculation of ANOVA as shown in table-1

9. Data Collection

After completion of experiment the student teachers were asked to do one exercise in each of the following programmes.

1. Word
2. Excel
3. PowerPoint
4. Access
5. HTML

Each exercise was of 20 marks and the total marks were 100. This way their achievement in IT practical was measured. Sum, Sum of the Squares, Mean and Standard Deviation of the achievement scores of the student teachers are shown in Table-2

Table-2 Sum, Sum of the Squares, SD and Mean of achievement Scores

Sum, Sum of the Squares, SD and Mean of achievement Scores							
Sex (C)	Faculty (A)	Science (A1)		Commerce (A2)		Arts (A3)	
	T.Strategy (B)	Demo. (B ₁)	Online (B ₂)	Demo. (B ₁)	Online (B ₂)	Demo. (B ₁)	Online (B ₂)
Male (C1)	Particular	A ₁ B ₁ C ₁	A ₁ B ₂ C ₁	A ₂ B ₁ C ₁	A ₂ B ₂ C ₁	A ₃ B ₁ C ₁	A ₃ B ₂ C ₁
	n	8	8	8	8	8	8
	x	660	632	657	637	660	592
	mean	82.50	79.00	82.13	79.63	82.50	74.00
	x ²	55016	50948	54281	51309	55340	44400
	sd	8.99	12.07	6.81	9.16	11.28	9.20
	sd ²	80.86	145.71	46.41	83.98	127.14	84.57
Female	Particular	A ₁ B ₁ C ₂	A ₁ B ₂ C ₂	A ₂ B ₁ C ₂	A ₂ B ₂ C ₂	A ₃ B ₁ C ₂	A ₃ B ₂ C ₂

(C2)	n	8	8	8	8	8	8
	x	672	641	663	637	660	592
	mean	84.00	80.13	82.88	79.63	82.50	74.00
	x ²	57008.00	52309.00	55157.00	51309.00	55340.00	44400.00
	sd	8.94	11.64	5.49	9.16	11.28	9.20
	sd ²	80.00	135.55	30.13	83.98	127.14	84.57

Mean achievement scores at the level of independent variables were calculated as shown in table – 3.

Table – 3 SD and Differences of means at the Level of Independent Variables

Variable	Level		SD	Mean	Mean Difference	
Faculty	Science	A ₁	9.83	81.41	A ₁ A ₁	0.47
	Commerce	A ₂	7.66	80.94	A ₂ A ₃	3.84
	Arts	A ₃	8.60	77.1	A ₁ A ₃	4.31
T.Strategy	Demo.	B ₁	8.05	82.4	B ₁ B ₂	5.17
	Online	B ₂	9.39	77.23		
Sex	Male	C ₁	8.60	79.11	C ₁ C ₂	1.41
	Female	C ₂	8.89	80.52		

In this study ANOVA was done to compare the achievement scores of the student teachers. One of the basic assumption of ANOVA is variance of the groups must not differ significantly. Therefore homogeneity of variance should be checked out before doing ANOVA. For that purpose here the Bartlett’s Test For Homogeneity of Variance was used. Table-4 shows the results of different calculations for Bartlett’s test of homogeneity of variance.

Table 4 Bartlett’s Test of Homogeneity of Variance

Sr.No	Particular	Value	Sr.No.	Particular	Value
1	$\sum XK^2$	7339.25	6	Difference(5 – 3)	0.4854
2	$\sum SK^2$	1048.46	7	Chi-square (X ²)	7.8232
3	$\sum \text{Log}SK^2$	22.81	8	Correction	1.0516
4	$\text{Log}(\sum SK^2/k)$	1.9414	9	Corrected(X ²)	7.4395
5	$k\{\text{log}(\sum SK^2/K)\}$	23.2965	10	Df	11

The value of needed for significance for 11 at 0.05 level is 19.675 according to the table. Since the obtained value as shown in table 4, is less than the needed value. This result leads to conclude that the variance within the cells of different groups may be treated as homogeneous. So ANOVA would be done.

10. ANOVA

As described in the previous point, the condition to be fulfilled to go for ANOVA is satisfied. Therefore, firsts of all, primary ANOVA was done.

Table –5 Primary ANOVA

Source of Variation	Sum of Squares	df	Mean Square	F
Main Effects	1047.15	4	261.79	2.996227476

Interaction	162.23	7	23.18	0.265251899
Error - Within Treatment	7339.25	84	87.37	
	8548.63	95		

By comparing the F value 2.9962 of main effects shown in table 5, it was found that it is more than F table value 2.49 df (4, 84) at 0.05 level of significance. It means the obtained F value of main effects shows significant difference. So analysis of variance is needed for all the variables. Detailed analysis of variance is shown in the following table.

Table 6

Source of Variation	Sum of Squares	df	Mean Square	F	Level of Significance
Faculty (A)	358.31	2	179.16	2.05	NS*
T.Strategy (B)	640.6666667	1	640.67	7.33	0.01+
Sex (C)	48.17	1	48.17	0.55	NS*
Faculty × T.Strategy (A × B)	150.02	2	75.01	0.86	NS*
T.Strategy × Sex (B × C)	0.04	1	0.04	0.00	NS*
Faculty × Sex (A × C)	11.52	2	5.76	0.07	NS*
Faculty × T.Strategy × (A × B × C)	0.65	2	0.32	0.00	NS*
Error- Within Treatment	7339.25	84	87.37		
Total	8548.63	95			

* Not significant.

+ Significant at 0.01 level of significance.

Significant F value at 0.05 and 0.01 levels of significance.

F(1, 84) at 0.05 level = 3.96 F(2, 84) at 0.05 level = 3.11 at 0.01 level = 6.96 at 0.01 level = 4.88

Study of null hypothesis:

Going through the table of detailed ANOVA and comparing obtained F values with the F table values one F ratio shows significant effect of independent variable on the achievement of the student teachers. By – studying the null hypothesis for the study, it was found out that which affects the achievement of pupils and which does not. The hypotheses were tested as under.

Study 1-Effect of faculty on the achievement of the student teachers in Information Technology.

The obtained F value 2.05 of faculty is less than F table value 3.11 for df (2,84) at 0.05 level of significance .So the null hypothesis that “There will be no significant difference between the mean achievement scores of Science, Arts and Commerce student teachers in Information technology. “ Was rejected and it was concluded that Teaching strategy has significant effect on the achievement of the student teachers in Information Technology. As the mean score of the student teachers taught by the demonstration method is

Study 2 – Effect of Teaching Strategy on the achievement of the student teachers in Information Technology.

The obtained F value 7.33 of teaching Strategy is more than F table value 6.96 for df (1,84) at 0.01 level of significance. So the null hypothesis that “Mean achievement scores of the student teachers who were taught by Demonstration method or by online method will not differ significantly.” Is rejected and it is concluded that teaching Strategy has a significant effect on the student teachers taught by Online method , as the mean achievement score 82.4 of the student teachers taught by

demonstration method is more than 77.23 that is mean achievement score of the student teachers taught by Online method.

Study 3 – Effect of Sex on the achievement of the student teachers in Information Technology.

The obtained F value 0.55 of Teaching Strategy is less than F table value 3.96 for df (1,84) at 0.05 level of significance. So the null hypothesis that “Mean achievement scores of Male and Female will not differ significantly” is accepted and it is concluded that sex of the student teachers does not affect their achievement in Information Technology.

Study 4 – Effect of the interaction between Faculty and Teaching Strategy on the achievement of the student teachers in Information Technology.

The obtained F value 0.86 of interaction between faculty and Teaching Strategy is less than F table value 3.11 df (2,84) at 0.05 level of significance So the null hypothesis that “There will be no significant effect of interaction between Faculty and Teaching Strategy on the mean achievement scores of the student teachers.” Is accepted and it is concluded that the interaction between Faculty and Teaching Strategy does not affect the achievement of the student teachers in information technology.

Study 5 - Effect of the interaction between Teaching and sex on the achievement of the student teachers in Information Technology.

The obtained F value 0.00 of interaction between Teaching strategy and the Sex is less than F table value 3.11 for df (2,84) at 0.05 level of significance. So the null hypothesis that “There will be no significant effect of interaction between faculty and Sex on the mean achievement scores of the student teachers.” is accepted and it is concluded that the interaction between teaching strategy and Sex does not affect the achievement of the student teachers in information technology.

Study 6 - Effect of the interaction between Faculty and sex on the achievement of the student teachers in Information Technology.

The obtained F value 0.07 of interaction between Teaching Strategy and the Sex is less than F table value 3.11 for df (2,84) at 0.05 level of significance. So the null hypothesis that “There will be no significant effect of interaction between Faculty and Sex on the mean achievement scores of the student teachers.” Is accepted and it is concluded that the interaction between Faculty and Sex does not affect the achievement of the student teachers in information technology.

Study 7 - Effect of the interaction among independent variables on the achievement of student teachers.

The obtained F value of 0.00 of interaction among Faculty, Teaching Strategy and Sex is less than F table value 3.11 for df (2,84) at 0.05 level of significance. So the null hypothesis that “There will be no significant effect of interaction among the independent variables on the mean achievement scores of the student teachers.” Is accepted and it is concluded that the interaction among the Faculty, Teaching Strategy and Sex does not affect the achievement of the pupils in mathematics.

11. Conclusions

1. The student teachers of Science, Commerce and Arts faculty are equally clever as far as their achievement in Information Technology is concerned.
2. The Student teachers who were taught by the demonstration method are cleverer than the student teachers taught by online method.
3. The male and female student teachers are equally clever as far as their achievement in Information Technology is concerned.
4. The student teachers of Science, Arts and Commerce taught by any method are equally clever as far as their achievement in Information Technology is concerned.
5. The male and female student teachers taught by any method are equally clever as far as their achievement in Information Technology is concerned.
6. The male and female student teachers of Science, Commerce and Arts faculties are equally clever as far as their achievement in Information Technology is concerned.

7. The male and female student teachers of Science, Commerce and Arts faculties and taught by Demonstration or Online method are equally clever as far as their achievement in Information Technology is concerned.

12. Implications

Going through the findings of this study we can say that the student teachers should be taught IT through demonstration method. The teacher should make the student write the steps of exercise after the demonstration.

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