

**Chapter IV**  
**DATA ANALYSIS, INTERPRETATION**  
**AND RESULT**

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#### **4.1 INTRODUCTION**

The analysis and interpretation of the data collected is a process that would make a research study significant and of great value to be mentioned. The findings of the study arrived at after this process would be of great help for deciding and implementing the further course of action. This would help in the development of the process of education. In the present study, the effect of ICT integrated teaching in Biology for grade IX students have been studied.

The present chapter deals with the analysis of the data, interpretation and discussion of the findings.

#### **4.2 OBJECTIVES OF THE STUDY**

1. To know the effect of ICT integrated and traditional teaching method in achieving learning outcomes of grade 9<sup>th</sup> students
2. To compare the effectiveness of ICT integrated and traditional teaching method in achieving learning outcomes in Boys of grade 9<sup>th</sup> students
3. To compare the effectiveness of ICT integrated and traditional teaching method in achieving learning outcomes in Girls of grade 9<sup>th</sup> students
4. To compare the effectiveness of ICT integrated teaching in achieving learning outcomes in Boys and Girls of grade 9<sup>th</sup> students

#### **4.3 HYPOTHESIS OF THE STUDY**

1. There will be no significant differences in the learning outcomes of students taught through ICT integration and traditional method.
2. There will be no significant difference in the learning outcomes between Boys taught through ICT integration and traditional method.
3. There will be no significant difference in the learning outcomes between Girls taught through ICT integration and traditional method.

4. There will be no significant difference in the learning outcomes between Boys and Girls taught through ICT integration strategy.

#### 4.4 OBJECTIVE WISE ANALYSIS AND INTERPRETATION OF THE DATA

There are two objectives and to achieve these objectives four hypothesis were formed and analysed.

##### Objective-1

To know the effect of ICT integrated and traditional teaching method in achieving learning outcomes of grade 9<sup>th</sup> students

##### Hypothesis-1

There will be no significant differences in the learning outcomes of students taught through ICT integration and traditional method.

**Table.4.1**

Difference between the achievement of control group & experimental group after the treatment on post test

Group	N	Mean	SD	D	df	Calculated t-value	Level of significance
Control	40	23.33	5.12	9.62	78	3.29	Significant at 0.01 level
Expt.	40	32.95	8.50				

N= Number of Sample SD = Standard Deviation, D = Mean Difference, df= Degree of Freedom and NS = Not Significance

##### Analysis

From table 4.1 it is evident that the calculated t-value for the degree of freedom 78 is found to be 3.29. The tabulated t-value at 0.01 level is 2.640. As our calculated t-value is greater than table value, so it is significant at 0.01 level of significance. Therefore, we have to reject the null hypothesis. This shows that there is significant difference between the mean achievement score of control group and experimental group.

##### Interpretation

The means of experimental and control groups are 32.95 and 23.33 respectively. The difference between these two means is 9.62, which is in favor of experimental group.

## Result

There is a significant difference between mean achievement scores of learners taught through the ICT integrated teaching and learners taught through the traditional teaching approach. As the mean difference is significant in favor of experimental group it can be concluded that ICT integrated teaching is more beneficial as compared to traditional teaching to achieve the learning outcomes.

## Objective-2

To compare the effectiveness of ICT integrated and traditional teaching method in achieving learning outcomes in Boys of grade 9<sup>th</sup> students

## Hypothesis-2

There will be no significant difference in the learning outcomes between Boys taught through ICT integration and traditional method.

**Table.4.2**

Difference between the achievement of control group boys & experimental group boys after the treatment on post test

Group	N	Mean	SD	D	df	Calculated t-value	Level of significance
Boys (Control)	24	22.96	4.56	7.94	53	3.89	Significant at 0.01 level
Boys (Expt.)	31	30.90	8.28				

N= Number of Sample SD = Standard Deviation, D = Mean Difference, df= Degree of Freedom and NS = Not Significance

## Analysis

From table 4.2 it is evident that the calculated t-value for the degree of freedom 53 is found to be 3.89. The tabulated t-value at 0.01 level is 2.672. As our calculated t-value is greater than table value, so it is significant at 0.01 level of significance. Therefore, we have to reject the null hypothesis. This shows that there is significant difference between the mean achievement score of control group boys and experimental group boys.

### Interpretation

The means of experimental and control group boys are 30.90 and 22.96 respectively. The difference between these two means is 7.94, which is in favor of experimental group.

### Result

There is a significant difference between mean achievement scores of learners taught through the ICT integrated teaching and learners taught through the traditional teaching approach. As the mean difference is significant in favor of experimental group it can be concluded that ICT integrated teaching is more beneficial as compared to traditional teaching to achieve the learning outcomes in boys.

### Objective-3

To compare the effectiveness of ICT integrated and traditional teaching method in achieving learning outcomes in Girls of grade 9<sup>th</sup> students

### Hypothesis-3

There will be no significant difference in the learning outcomes between Girls taught through ICT integration and traditional method.

**Table.4.3**

Difference between the achievement of control group Girls & experimental group Girls after the treatment on post test

Group	N	Mean	SD	D	df	Calculated t-value	Level of significance
Girls (Control)	16	23.88	5.27	16.12	23	4.08	Significant at 0.01 level
Girls (Expt.)	09	40	4.80				

N= Number of Sample SD = Standard Deviation, D = Mean Difference, df= Degree of Freedom and NS = Not Significance

### Analysis

From table 4.3 it is evident that the calculated t-value for the degree of freedom 23 is found to be 4.08. The tabulated t-value at 0.01 level is 2.807. As our calculated t-value is greater than table value, so it is significant at 0.01 level of significance. Therefore, we have to reject the null hypothesis. This shows that there is significant difference between the mean achievement score of control group girls and experimental group girls.



## Interpretation

The means of experimental and control group boys are 40 and 23.88 respectively. The difference between these two means is 16.12, which is in favor of experimental group.

## Result

There is a significant difference between mean achievement scores of learners taught through the ICT integrated teaching and learners taught through the traditional teaching approach. As the mean difference is significant in favor of experimental group it can be concluded that ICT integrated teaching is more beneficial as compared to traditional teaching to achieve the learning outcomes in girls.

## Objective-4

To compare the effectiveness of ICT integrated teaching in achieving learning outcomes in Boys and Girls of grade 9<sup>th</sup> students

## Hypothesis-4

There will be no significant difference in the learning outcomes between Boys and Girls taught through ICT integration strategy.

**Table.4.4**

Difference between the achievement of experimental group Boys and experimental group Girls after the treatment on post test

Group	N	Mean	SD	D	df	Calculate d t-value	Level of significance
Boys (Expt.)	31	30.90	8.28	9.1	38	0.0003	NS
Girls (Expt.)	09	40	4.80				

N= Number of Sample SD = Standard Deviation, D = Mean Difference, df= Degree of Freedom and NS = Not Significance

## Analysis

From table 4.4 it is evident that the calculated t-value for the degree of freedom 38 is found to be 0.0003. The tabulated t-value at 0.05 level is 2.024. As our calculated t-value is smaller than table value, so it is not significant at 0.05 level of significance. Therefore, we have to accept the null hypothesis. This shows that there is no significant difference between the mean achievement score of experimental group boys and experimental

group girls.

### **Interpretation**

The means of experimental group boys and experimental group girls are 30.90 and 40 respectively. The difference between these two means is 9.1, which is in favor of experimental group.

### **Result**

There is no significant difference between mean achievement scores of learners taught through the ICT integrated teaching approach between boys and girls. As the mean difference is not significant it can be concluded that ICT integrated teaching is equally beneficial for boys and girls to achieve the learning outcomes.

## **4.5 CONCLUSION**

The results of the present study show that the ICT-based teaching methods used in the study were effective in improving the learning outcomes with regard to the concepts of Biology. The students also had developed a heightened sense of the concepts of cell. This chapter reaches its closure with the analysis and interpretation of data in detail. The summary and conclusion of the findings are reported in the next chapter.