

A Study of the Effectiveness of ICT-Mediated Teaching Method over Traditional Teaching Methods on Life Science at Secondary School Level

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Abstract: *The study aims to understand whether ICT-mediated teaching methods are more effective than Traditional methods in teaching Life Science, at secondary school level. Some previous experiments and studies have shown that ICT-mediated teaching methods contribute towards better learners' achievement. The study has been performed by using a Quasi-Experimental Research Design (pre-test post-test control group design) in a co-educational school, on a group of fifty students, who served first as the control group and then as the experimental group and were taught by both methods. The result of the study clearly shows that ICT-mediated teaching methods contribute significantly more in learning of Life Science, as compared to Traditional teaching. The ICT-mediated methods benefit both boys and girls and help in the steady improvement of Low and Medium categories of Achievers into the High Achievers' category.*

Keywords: ICT-mediated Teaching Method, Traditional Methods of Teaching, Teaching Life Science

1. Introduction

Teaching Life Science often includes explaining topics such as cells, organelles, organs, and physiological processes, hormonal regulation, oxygen transport, controlled experiments and the principle of structure and function which are met by learning difficulties among students [1]. Concepts are sometimes abstract or difficult for students to visualise and understand. It includes learning about the structures and functions of diverse life forms. 2D printed images in textbooks do help to represent those concepts, albeit partially. This study tries to explore whether ICT-integrated teaching methods like usage of smart boards, videos, Power Point presentations, animated graphic images etc. can help to improve the performance of students and overcome the challenges of teaching such Life Science topics better, as compared to Traditional methods at the secondary level, which has not been extensively studied so far.

Traditional methods include the familiar techniques of lecturing the class, using rote-and-drill memorization, reading textbooks or classroom discussions which are mainly teacher led. They do help students to imbibe basic knowledge superficially, but don't necessarily spark deep understanding and analysis, especially of difficult concepts.

Integration of Information and Communication in the classroom has been transforming the way learners are learning today. Teachers in India are also interested to explore innovative ways to teach with the help of ICT tools. They are using various digital platforms for planning their lessons, delivering them in the classroom setup or virtually,

and conducting the assessment as well. The National Education Policy of India, 2020 has also emphasized the usage of technology in education. The policy calls for investment in digital infrastructure, development of online teaching platforms and tools, creation of virtual labs and digital repositories, training teachers to become high-quality online content creators, designing and implementation of online assessments, establishing standards for content, technology, and pedagogy for online teaching-learning [2].

Among Gardner's 8.5 multiple intelligences verbal/linguistic, visual/spatial, and musical/rhythmic are core intelligences in every student's brain. These three intelligences are part of that unique profile of strong and weak intelligences that every student possesses. Videos can tap verbal/linguistic and visual/spatial, and even musical/rhythmic intelligence [3].

In general, it seems that ICT devices and ICT-based activities, when effectively infused in Science teaching can facilitate greater learning in the Science class. It has the power to engage students and to open up new avenues of knowledge accessibility. However, a balance must be arrived at between using computer simulations, demonstrations, PowerPoint presentations, virtual experiments, real hands-on practical activities, and traditional collaborative group work [4].

2. Literature Review

In recent years, owing to the unprecedented advancement in technology in all spheres of life, education has not been far behind. Several studies have been done to understand how

technology can leverage learning outcomes and prove to be beneficial in improving the achievement levels among pupils. The necessity and techniques of integrating technology with education as against the traditional means of imparting education which we have known so far, has been an area of constant debate and contemplation. It is an interesting field of ongoing research throughout the world.

In a survey on “The Effects of Using Videos in Biology Lessons on Student Performance” done by Whajah Samuel Miezah from Ghana and Gifty Whajah from China, in the year 2023, the findings showed a statistically significant difference between the forms of instruction and the learning outcomes of the students. The study investigated an examination of how the use of multimedia in a Biology lesson affected students' performance. Three senior high schools' worth of 200 students were chosen at random, and they were divided into three groups at random. The study's quasi-experimental pre-post-control group design was used. While the control group received conventional care, the experimental groups were trained via multimedia presentations. The course of treatment lasted for 12 weeks. Students receiving multimedia-assisted instruction performed better than their peers receiving traditional instruction. Therefore, it is advised that multimedia assisted instruction be implemented in the senior high school Biology curriculum to enhance students' learning results [5].

Dr. Shazli Hasan Khan conducted an empirical study in U.P. to study the “Effectiveness of Video Based Instruction among Secondary School Biology Student's Academic Achievement” in 2019. The objectives were to measure the level of impact of video-based instruction on academic achievement in Biological Science among secondary school students and to find out the significant difference on the mean value towards the impact of video-based instruction on academic achievement in Biological Science with respect to gender and locality of secondary school students. The post-test mean academic achievement scores in Biology of the experimental group students was higher than the control group students on total sample and the post-test mean academic achievement scores in Biology of control and experimental group students were better than the pre-test mean academic achievement scores of control and experimental group students with regard to gender and locality. It was concluded that as teacher educators, the aim is to get students energized and engaged in the hands-on learning process, and video-based instruction is clearly an instructional medium that is compelling and generates a much greater amount of interest and enjoyment than the more traditional printed material. Using sight and sound, video is the perfect medium for students who are auditory or visual learners. With the added use of subtitles each child then has the choice to watch, listen to, or read each presentation. Video stimulates and engages students creating interest and maintaining that interest for longer periods of time, and it provides an innovative and effective means of educators to address and deliver the required curriculum content [6].

3. Objectives of the Study

The following objectives are formulated for the study:

- 1) To study the effect of ICT-mediated teaching method on the performance of students in Life science, at secondary level.
- 2) To compare the effect of ICT-mediated teaching method and Traditional teaching method on the performance of students in Life Science, at secondary level, on the basis of their gender.
- 3) To compare the effect of ICT-mediated teaching method and Traditional teaching method on the performance of students in Life Science, at secondary level, on the basis of their academic achievement.

4. Hypotheses of the Study

The following hypotheses are formulated to empirically validate the above objectives:

- H1) There will be no significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to ICT-mediated teaching method and Traditional method.
- H2) There will be no significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to ICT-mediated teaching method and Traditional method, with respect to their gender.
- H3) There will be no significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to ICT-mediated teaching method and Traditional method, with respect to their academic achievement.

Delimitations

The following delimitations were faced during the study:

- a) The study was done only on students of 6th standard.
- b) The study was done only on students of a school affiliated to the CBSE board.
- c) The study was done only in an urban area, where schools have smart boards installed in the classrooms.
- d) The study was done based on only one chapter (one unit) of Life Science.
- e) The study was done within a time constraint of six teaching periods only.

5. Methodology

The methodology of the study comprises method of research, population, sample, tool, procedure of data collection, and procedure of data analysis. In this Experimental Research Design, Quasi Experimental Research (pre-test post-test control group design) has been used. The target population of the study were the students of Class VI of a co-educational school, affiliated to the CBSE board, in an urban area in South Kolkata. The 50 students, who served as the samples, were chosen through purposive sampling. The tools and techniques used for the study included 1. Treatment Module (Teaching a chapter on Movements of the Body, first with Traditional methods and then ICT-mediated methods which included mainly videos, within an interval of one month), 2. Diagnostic Test (Pre-test) consisting of an MCQ-based questionnaire having 20 questions and 3. Achievement Tests (Post-tests) consisting of MCQ-based questionnaires having 20 questions each.

Table 1: Procedure of Data Collection and Experimentation

Group	Pre-test	Treatment	Post-test
Control	O ₁	X ₁	O ₂
Experimental	---	X ₂	O ₃

O₁: Pre-test

O₂: O₃: Post-test

X₁: Teaching by Traditional Method

X₂: Teaching by ICT-mediated Method

Variables

Independent Variables- Traditional Methodology, ICT-mediated teaching methodology

Dependent Variables- Academic achievement in Life Science.

This was a continuous assessment approach. Before teaching the lesson, a Diagnostic Test O₁ was taken. Then the students were taught the chosen unit using Traditional methods (X₁). An achievement test O₂ was conducted. There was an interval of one month after O₂, following which, ICT mediated teaching (X₂) was executed and another achievement test O₃ was conducted.

The data collected from the pre-test and the post-tests were analysed with the help of Statistical Techniques like mean, standard deviation, standard error of mean difference (SEMD), 't' test and chi-square test.

6. Results

Descriptive statistics of data was collected from the pre-test, taken before teaching the lesson and two post-tests, one taken after treatment X₁ (Traditional teaching method) and another after treatment X₂ (ICT-integrated teaching method), given to both experimental and control groups. Significance of hypotheses was found by using t-test and chi-square test.

6.1 Testing Hypothesis H1

There will be no significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to ICT-mediated teaching method and Traditional method.

Percentage of mean (On the basis of Methods of Teaching)

The mean was calculated and the mean percentage was also tabulated for the 50 samples.

Interpretation: Based on the Percentage of Mean values in Table 2, a graph is plotted. Figure 1 shows that teaching by Traditional Methods improved their scores in O₂ as compared to O₁, which was conducted before teaching the topic to them. However, ICT-integrated methods improved the understanding of students more than the Traditional

method, as their percentage of mean in the achievement test O₃ increased further after being taught by this method. This is depicted by a rise in the slope of the graph in O₃.

Table 2: Mean and Percentage of Mean values based on Methods of teaching

O ₁		O ₂		O ₃	
Mean	% of Mean	Mean	% of Mean	Mean	% of Mean
14.3	71.5%	15.24	76.2%	17.4	87%

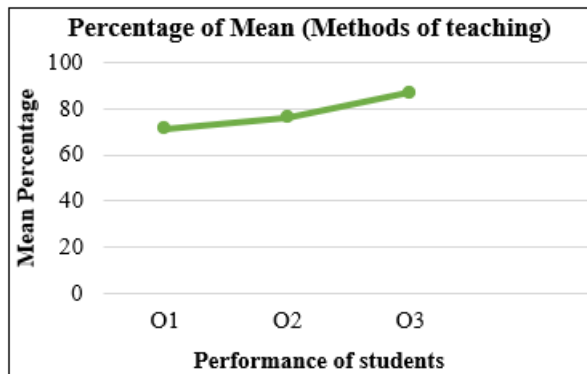


Figure 1: Percentage of Mean (based on methods of teaching)

Mean Difference (On the basis of Methods of Teaching)

The bar graph depicts the difference between the Mean Percentage of scores obtained.

Interpretation: Figure 2 shows the Mean Difference between the scores obtained by the students based on the percentage of mean. The difference between the percentages obtained in O₁ and O₃ is more than that between O₁ and O₂. Thus, it can be said that ICT-mediated teaching helps to improve the performance of the students more effectively than Traditional methods.

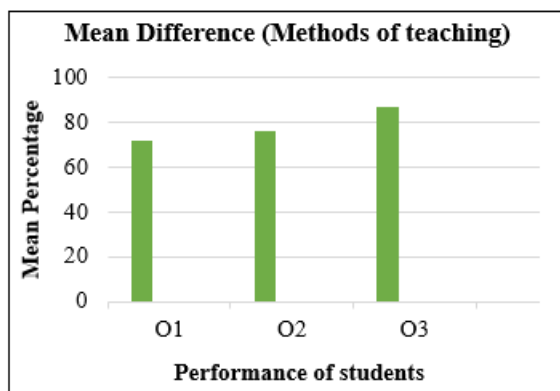


Figure 2: Mean Difference (based on the methods of teaching)

Results of descriptive statistics and t-test

Table 3: Testing of hypothesis H1

Descriptive Statistics					t-test for equality of means			Remarks
Independent variable	Dependent variable	N	Mean	SD	Df	t-calculated value	t-Table value	
Control group (traditional teaching)	Post-test O2 achievement test scores	50	15.24	2.90	98	3.724	1.987	Significant at 0.05 level of significance
Experimental group (ICT-mediated teaching)	Post-test O3 achievement test scores	50	17.4	2.90	98	3.724	1.987	

Interpretation: Both the groups of students were subjected to teaching by Traditional methods and then ICT-mediated methods within a gap of one month to compare their effectiveness. The table shows that the mean of post-test scores of the control group (taught by traditional method) was 15.24, with SD 2.90 and mean was 17.4 for the experimental group (taught by ICT-mediated methods) with SD 2.90. Whether the difference of mean is significant or not, the t-test is employed and after analysis it was found that (Table 3) the calculated $t(98) = 3.724$, Table value = 1.987. Since the calculated t-value is higher than the table value, therefore the 't' is significant and H1 is rejected at 0.05 level of significance. So, the hypothesis was not accepted. There is a significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to ICT-mediated teaching method and Traditional teaching methods.

Findings

- 1) There is a significant difference between the performance of students in Life Science when taught by Traditional methods versus ICT-mediated teaching methods.
- 2) ICT-mediated teaching proves to be beneficial to students as it grasps their attention and makes it easier to understand the abstract concepts of Life Science.
- 3) Traditional methods of teaching help to build basic concepts and memorise key facts.
- 4) ICT-mediated methods are better than Traditional methods of teaching as they significantly help to improve the mean scores of students.

6.2. Testing Hypothesis H2

There will be no significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to ICT-mediated teaching method and Traditional method, with respect to their gender. This hypothesis has been further sub-divided as under: There will be no significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to Traditional teaching method, with respect to their gender.

- a) (b) There will be no significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to ICT-mediated teaching with respect to their gender.

Percentage of mean (On the basis of Gender)

Total number of girls in the class: 18, Total number of boys in the class: 32

Table 4: Percentage of Mean values based on the gender of the students

	O ₁		O ₂		O ₃	
	Mean	% of Mean	Mean	% of Mean	Mean	% of Mean
Girls	15.16	75.83%	16.5	82.5%	18	90%
Boys	13.81	69.06%	14.5	72.5%	17	85.3%

A graph, Figure 3, was plotted based on the values obtained in the Table 4, to study the differences in the perception of knowledge, based on gender.

Interpretation: The Figure 3 depicts that the percentage of mean scored by girls is consistently more throughout, than that scored by boys. Additionally, scores improved for both genders after teaching using the Traditional method, seen by the rise in the slopes of the graph, more noticeably in girls than boys. Interestingly, after teaching the class using ICT-integrated methods, overall performances improved further more in both genders, as shown by the rise in both the slopes of the graph in O₃ as well. Boys improved more rapidly than girls as seen from the steeper slope of the graph.

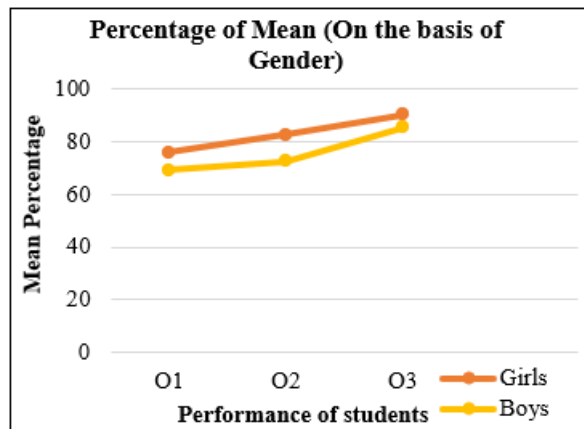


Figure 3: Percentage of Mean (on the basis of gender)

Mean Difference (On the basis of Gender)

The bar graph depicts the difference between the Mean Percentage of scores obtained, on the basis of gender, after the students were taught using both the teaching strategies.

Interpretation: Figure 4 shows the Mean differences in percentages of mean scores in the Diagnostic Test and the Achievement Tests conducted after teaching using the Traditional and ICT-integrated methods, among boys and girls. Though both genders are benefited by Traditional teaching methods, girls score way higher than boys as seen from the difference in the heights of the column bars. After teaching using ICT-integrated teaching methods, the mean score of boys is much closer to girls and there is very little difference. It means that ICT-integrated methods have a better effect on students' learning as it helps to bridge the gap between boys and girls and brings them at par with each other. Overall, both boys and girls benefit from ICT-integrated method.

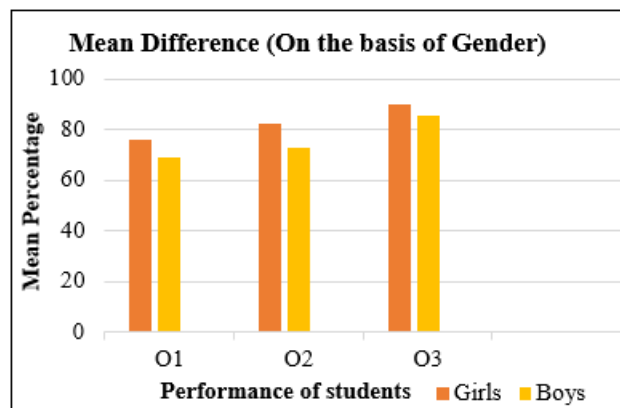


Figure 4: Mean Difference (on the basis of gender)

Results of descriptive statistics and t-test

(a) There will be no significant difference in the performance of students in Life Science between the

experimental group and the control group, with relation to Traditional teaching method, with respect to their gender.

Table 5: Testing of hypothesis H2, Part (a)

Descriptive Statistics					t-test for equality of means			Remarks
Independent variable	Dependent variable	N	Mean	SD	Df	t- calculated value	t-table value	
Girls	Post-test O2 achievement test scores	18	16.5	3.20	48	2.23	2.011	Significant at 0.05 level of significance
Boys	Post-test O2 achievement test scores	32	14.5	3.20	48	2.23	2.011	

Interpretation: Both the groups of students were subjected to teaching by Traditional methods to compare its effectiveness on the basis of gender. The table shows that the mean of post-test scores of the girls after the Traditional method was 16.5, with SD 3.20 and mean was 14.5 for the boys, with SD 3.20. Whether the difference of mean is significant or not, the t-test is employed and after analysis it was found that (Table 5) the calculated $t(48) = 2.23$, Table value = 2.011. Since the calculated t-value is higher than the table value, therefore the 't' is significant and H2 Part (a) is

rejected at 0.05 level of significance. So, the hypothesis was not accepted. There is a significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to Traditional teaching method, with respect to their gender.

(b) There will be no significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to ICT-mediated teaching with respect to their gender.

Table 6: Testing of hypothesis H2, Part (b)

Descriptive Statistics					t-test for equality of means			Remarks
Independent variable	Dependent variable	N	Mean	SD	Df	t- calculated value	t-table value	
Girls	Post-test O3 achievement test scores	18	18	2.48	48	1.44	2.011	Not significant at 0.05 level of significance
Boys	Post-test O3 achievement test scores	32	17	2.48	48	1.44	2.011	

Interpretation:

Both the groups of students were subjected to teaching by ICT-mediated methods to compare its effectiveness on the basis of gender. The table shows that the mean of post-test scores of the girls after the ICT-mediated method was 18, with SD 2.48 and mean was 17 for the boys, with SD 2.48. Whether the difference of mean is significant or not, the t-test is employed and after analysis it was found that (Table 6) the calculated $t(48) = 1.44$, Table value = 2.011. Since the calculated t-value is lower than the table value, therefore the 't' is not significant and H2 Part (b), is accepted at 0.05 level of significance. So, the hypothesis was accepted. There

is no significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to ICT-mediated teaching with respect to their gender.

Findings

- 1) There is a significant difference between the performance of girls and boys in Life Science, when taught by Traditional methods.
- 2) Girls have scored significantly higher than boys when taught by Traditional methods like lecture-methods, use of textbooks, discussions etc.
- 3) There is no significant difference between the performance of boys and girls in Life Science, when taught by ICT-mediated methods as they perform equally well.
- 4) Girls and boys both are benefited by ICT-mediated teaching techniques and boys improve much faster than girls when they learn through technology.

6.3 Testing Hypothesis H3

There will be no significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to ICT-mediated teaching method and Traditional method, with respect to their academic achievement.

Percentage of mean (On the basis of Level of Achievement)

Table 7 shows the cut-off percentages for grouping students into various achievers' categories, on the basis of their academic achievement, as advised by the board. Some class intervals have been clubbed for convenience.

Interpretation: Table 8 shows that after O₂ and O₃, there were no Low achievers in the class. Using the values obtained in Table 8, a graph is plotted. Figure 5 shows that Percentage of mean of Medium achievers initially dropped after being taught by the Traditional method of teaching.

Table 7: Cut-off percentages and marks for Level of Achievement

Level of achievement	Percentage out of 100	Marks out of 20
Low achievers	0-32%	0-6
Medium achievers	33-70%	7-14
High achievers	71-100%	15-20

Table 8: Mean and Percentage of Mean values based on the Level of Achievement of the students

Level of Achievement	O ₁		O ₂		O ₃	
	Mean	% of Mean	Mean	% of Mean	Mean	% of Mean
Low achievers	4	20%	N.A.	N.A.	N.A.	N.A.
Medium achievers	12	60%	10.93	54.65%	12.14	60.7%
High achievers	16.39	81.95%	17.26	86.30%	18.25	91.25%

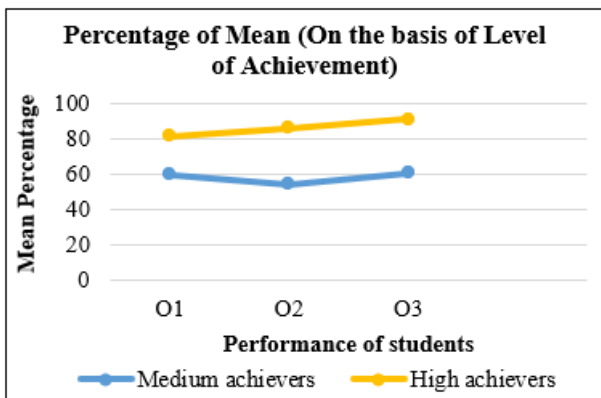


Figure 5: Percentage of Mean (on the basis of academic achievement)

However, after teaching them using the ICT-integrated methods, they showed improvement in scores, depicted by the rise in the slope of the graph. For the High achievers, they showed gradual and consistent improvement after being taught using both Traditional methods and ICT-integrated methods. The Low achievers were benefited by both the teaching strategies as we can see that there were no students left in this category when achievement tests were taken after teaching by both Traditional and ICT-mediated methods.

Mean Difference (On the basis of Level of Achievement)

The bar graph depicts the difference between the Mean Percentage of scores obtained, on the basis of academic achievement levels, after the students were taught using both the teaching strategies.

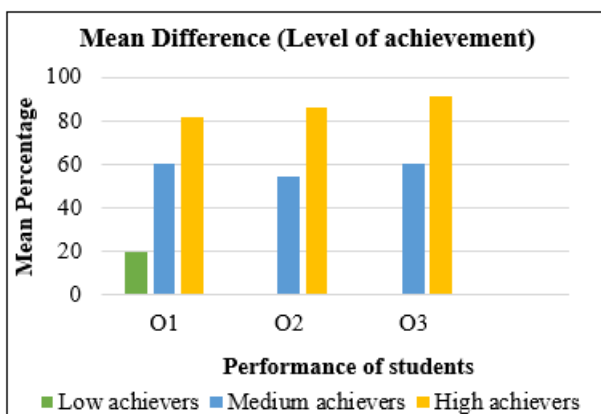


Figure 6: Mean Difference (on the basis of academic achievement)

Interpretation: Low achievers were benefited by both the teaching methods. Mean scores of Medium achievers dropped initially after being taught by Traditional methods which could be due to increase in the new learning content

and Traditional methods being able to give them only basic level understanding of the same. Their mean scores rose after ICT-integrated teaching methods were used in the class. Among the High achievers, Traditional methods increased their mean scores but there was a greater increase when ICT-mediated teaching was employed.

N.B. Due to constraint of time, normality could not be maintained and hence, a non-parametric chi-square test was performed to test the hypothesis for this quasi-experimental research done on the students chosen through purposive sampling.

Results of the chi-square test

The results of the chi square to test the hypothesis are depicted in Tables 9 and 10.

Table 9: Testing of hypothesis H3 (Table of Contingency)

	Control group (Traditional teaching)	Experimental group (ICT-mediated teaching)	Total
No. of Low Achievers	0 (f ₁)	0 (f ₄)	0
No. of Medium Achievers	16 (f ₂)	7 (f ₅)	23
No. of High Achievers	34 (f ₃)	43 (f ₆)	77
	50	50	Grand Total = 100

Table 10: Chi-square calculation, 0.01 level of significance

f _o	f _e	f _o -f _e	(f _o -f _e) ²	$\frac{(f_o-f_e)^2}{f_e}$	$\chi^2 = \sum \frac{(f_o-f_e)^2}{f_e}$ 98.38
0	16.7	-16.7	278.89	16.7	
16	16.7	-0.7	0.49	0.02	
34	16.7	17.3	299.29	17.92	
0	16.7	-16.7	278.89	16.7	
7	16.7	-9.7	94.09	5.63	
43	16.7	26.3	691.69	41.41	

Degrees of freedom = 3-2 = 1

At 0.01 level of significance, df (1), Table value = 9.21. Calculated chi-square value = 98.38.

Interpretation: Hence, the chi-square value (Table 10) is significant and the hypothesis H₃ is rejected. There is a significant difference in the performance of students in Life Science between the experimental group and the control group, with relation to ICT-mediated teaching method and Traditional method, with respect to their academic achievement.

Findings

- 1) There is a significant difference in the performance of the Low, Medium and High achievers in Life science, when they are taught by ICT-mediated methods.
- 2) The Low achievers were benefited when taught by both Traditional Methods and ICT-mediated methods.
- 3) Medium achievers found it difficult to perform well when taught by Traditional methods but their mean improved back to their previous score after being taught by the ICT-mediated methods. So, this method is beneficial for them.

4) The High achievers performed consistently well and were benefited by both teaching methods. However, their mean score was better with ICT-mediated teaching.

6.4. Percentage of Students (On the basis of Performance in the Tests) in various Achievement Categories

The Table 11 depicts the number of students, as well as percentage of students in each of the Achievement categories, after the Diagnostic and Achievement tests.

Table 11: Number and Percentage of Achievers in each category after the Diagnostic and Achievement Tests (n= 50)

Category	O1		O2		O3	
	Number	Percentage	Number	Percentage	Number	Percentage
Low achievers	1	2%	0	0	0	0
Medium achievers	21	42%	16	32%	7	14%
High achievers	28	56%	34	68%	43	86%

Interpretation: Table 11 shows that initially, some students lacked understanding of the content and hence 2% of learners were Low achievers. After teaching using the

Traditional and ICT-integrated methods, there were no more Low achievers.

Teaching using ICT-integrated methods, advanced learners from the Medium achievers to the High achievers' category.

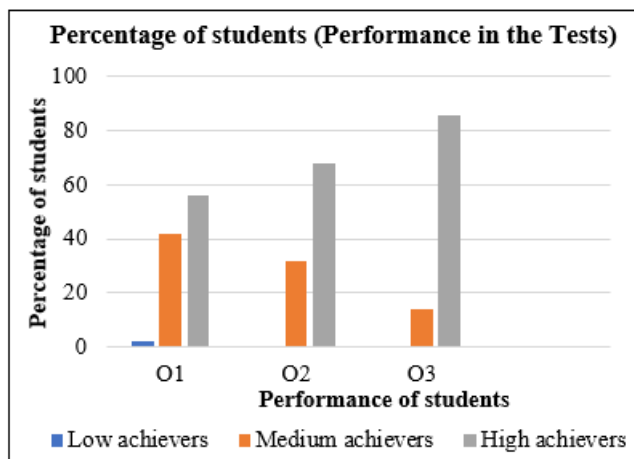


Figure 7: Percentage of students in each academic category

Interpretation: Figure 7 shows that teaching using ICT-integrated method helped students to improve their understanding as there was a noticeable shift of Medium achievers to the High achievers' category and Low achievers to higher levels. Use of Traditional methods also shifted learners from the Low achievers to the Medium or High achievers' category and Medium achievers to High achievers' group. Hence, we can say that use of Traditional methods of teaching is not totally redundant whereas ICT-mediated methods improve the overall performance of the entire class more effectively.

Findings:

It was found that teaching by Traditional as well as ICT-mediated methods improved the performance of Low achievers. However, there were lesser Medium achievers after the first Achievement test. Traditional learning helped many of them to achieve higher scores, but noticeably, ICT-mediated learning helped majority of Medium achievers to move up to the High achievers' category. Maximum students were added to the High achievers' category with ICT usage.

7. Discussion

1) ICT-mediated teaching methods can help to engage learners more actively and develop concept building, which improves the percentage of mean achieved by the class. Such multimedia integrated classes, including video clips and images or animations can help to create visual imagery of abstract concepts. ICT-mediated methods of teaching improve learners' achievement more than Traditional methods.

Table 12: Results of Hypotheses Testing

Null Hypothesis	t/Chi	Sig.	Rejected/ Accepted
H1	t-value 3.724	0.05	Rejected
H2 Part (a)	t-value 2.23	0.05	Rejected
H2 Part (b)	t-value 1.44	0.05	Accepted
H3	Chi value 98.38	0.01	Rejected

2) Girls perform significantly better by Traditional learning methods. But overall, it is understood that ICT-mediated teaching methods do not favour any one particular gender, as both boys and girls show equally good performance when taught by it.

3) Use of ICT-mediated teaching techniques helps the Low achievers and medium achievers to improve their performance and move up to the High achievers' category.

There is a significant difference in their performance when taught by Traditional versus ICT-mediated methods.

8. Conclusion

ICT-mediated teaching methods effectively favour the students at secondary school level, to improve their concept building and analytical skills, which enhances their abilities to master the higher cognitive levels of Bloom's Taxonomy. The ICT-mediated techniques ensure that students create the correct imagery of abstract Life Science concepts, based on the teacher's explanation. These methods attract students' attention and appeal to their visual and auditory senses in innumerable ways, lighting up their imagination. It engages even the slowest learner in the class. Both girls and boys find technology integrated teaching appealing and interesting. It breaks the monotony of the class and aids teachers to overcome their limitations in terms of explaining abstract concepts.

Thus, ICT-integrated teaching methods should be introduced and utilized in teaching Life Science in secondary schools. However, both teachers and students need to be professionally trained to equip themselves with the know-hows of handling technology integrated lessons, to reap its maximum benefit.

9. Future scope for research

The following is to be studied further and understood-

- 1) If there is any significant difference between the experimental and control group in Life Science, with respect to Traditional and ICT-mediated teaching methods, in Classes other than Class VI as well as schools affiliated to other boards, at the secondary level.
- 2) If there is any significant difference between the experimental and control group in Life Science, with respect to Traditional and ICT-mediated teaching methods, in rural areas, at secondary school level.
- 3) If there is any significant difference between the experimental and control group in subjects other than Life Science, with respect to Traditional and ICT-mediated teaching methods, at secondary school level.
- 4) It is to be understood why girls perform better than boys when taught by Traditional methods and boys improve faster when taught using ICT-mediated methods.

References

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