

DEVELOPMENT OF ART INTEGRATED PROGRAM AND ITS EFFECTIVENESS AMONG STUDENTS IN PUNE CITY

Rita Shamal, Research Scholar, MIT World Peace University, Department of Education
Pune, Maharashtra (India)

Dr. Sachin J. Sakhare, Assistant Professor and Ph.D. Supervisor, MIT World Peace University,
Department of Education, Pune, Maharashtra (India)

ABSTRACT

The current research work concerned with study on development of Art Integrated Program and its effectiveness among school students in Pune city. Art Integrated has it's important for the students for present their basic knowledge of the content. The concept of 'Art Integrated' education is a teaching approach that incorporates various forms of art into the learning process. The main goal of the Art Integrated is to enhance understanding and engagement across different subjects by integrating artistic elements such as visual arts, music, dance, drama, and creative writing. The main approach can make learning more dynamic and engaging by linking academic content with creative expression for better understanding.

Students need to understand the concepts, applications of knowledge gained through art integration at the school age in accordance with subject content. Art Integrated Education (AIE) plays a crucial role in enhancing the overall learning experience and developing various skills in students. The present research paper focused on to study on the development of Art Integrated Program and its effectiveness among school students in Pune city, with prime objectives are- i) To study the present status of Art Integrated Education of VII std. Students. ii) To develop the Art Integrated Program for VII std. Mathematics subject. iii) To define the effectiveness of Art Integrated Program for VII std. Mathematics subject.

Research methodology is a different type involving a conversations, interpretative way, and observations and studies the secondary sources- like books, articles, journals, research works, expert opinions, and internet source, etc.

Keywords: Development Program, Art Integration, Effectiveness

1.1 INTRODUCTION

Art Integration Education (AIE) is an innovative educational approach that incorporates artistic methods and best practices into the teaching of traditional academic subjects. Art Integration Education treating art as a separate discipline, Art Integration Education aims to the enhance students learning experiences, deepen their understanding of academic concepts and foster a more engaging and holistic educational environment and better interactions.

Concept of Art Integration Education:

“Art-integration is a cross-curricular pedagogical approach that utilizes various aspects and forms of art and culture as the basis for learning of concepts across subjects. As a part of the thrust on experiential learning, art-integrated education will be embedded in classroom transactions not only for creating joyful classrooms but also for imbibing the Indian ethos through the integration of Indian art and culture in the teaching and learning process at every level. This art-integrated approach will strengthen the linkages between education and culture.” (NEP 2020 stated on page 12 (para 4.7))

Theoretical Background of the Research:

School is the most important social institution, that impacts culture on students. Students need to understand the importance of Art Integration for Mathematics subject, Mathematical reasoning, applications of knowledge gained through mathematics factors at the school age in accordance with this school. Students are exposed to concept understanding and the skills to inculcate positive culture through Art Integration for Mathematics subject.

a. NEED OF PRESENT RESEARCH

- i) Mathematics subject is the related to the study of quantity, structure, space, and change. It's a branch of science that uses numerical values, formulas, and logical activities to describe and manipulate abstract. The present research work is significant to the school students to study the effectiveness of Art Integration Program on Mathematics subject for VII Grade students.
- ii) For Mathematics subject, traditional teaching methods can sometimes fail to engage students regularly. Art Integration Program create and make learning more interactive and engaging by incorporating creative activities, which can capture students' interest and enthusiasm and create positive atmosphere.
- iii) For Mathematics subject, integrating art into the curriculum transforms learning from a passive experience into an active and enjoyable and innovative process.
- iv) Art Integration encourages students to think creatively and approach problems from different perspectives for Mathematics subject.

1.3 IMPORTANCE OF PRESENT RESEARCH

- 5 Integrating art into academic Mathematics subjects can reinforce learning by providing hands-on, experiential opportunities to explore and understand complex concepts. For example, creating a model or a visual representation of a scientific process can help solidify students' understanding the Mathematic concepts.
- 6 Art Integration Program can address the educational gaps by providing alternative ways for students to access and understand the Mathematical content, particularly for those who may struggle with traditional methods of instruction.

1.4 STATEMENT OF THE PROBLEM

Development of the Art Integration Programme and its effectiveness for VII std. students from English medium CBSE secondary school in Pune city of Maharashtra state.

1.5 OBJECTIVES

- i) To study the present status of Art Integrated Education of VII std. Students.
- ii) To develop the Art Integrated Program for VII std. Mathematics subject.
- iii) To define the effectiveness of Art Integrated Program for VII std. Mathematics subject.

1.6 ASSUMPTIONS

- 6 1. A student centered action programme for school students to create an impact of Arts Integration on Student Learning. (Ref. Catterall, J. S., & Waldorf, L., 2022)
- 7 Arts Integration and Its Impact on Students' Academic Performance: A Meta-Analysis- It synthesizes findings to provide a comprehensive overview of how art integration influences student achievement. (Ref. Wilson, B., & L. L. Wiggins, 2014)

1.7 HYPOTHESIS

1. Research Hypothesis: H1- There is a significant difference between mean score of pre-test and post-test of experimental group for selected components of VII std. Mathematics for Art Integrated program.

H2- There is a significant difference between mean score of post-test after the development of Art Integrated program to the experimental group and traditional method of teaching to control group for the selected components of the subject of Mathematics in VII std.

2. Null Hypothesis: H01- There is no significant difference between mean score of pre-test and post-test of experimental group for selected components of VII std. Mathematics for Art Integrated program.

H02- There is no significant difference between mean score of post-test after the development of Art Integrated program to the experimental group and traditional method of teaching to control group for selected components of the subject of Mathematics in VII std.

1.8 SCOPE OF RESEARCH

🔗 **Geographical Scope:** The present research is applicable to all students of VII std. English medium secondary schools in Pune city of Maharashtra state.

🔗 **Conceptual Scope:** The content scope of the present research is from seven std. Mathematics subject for selected two topics are applicable.

1.9 LIMITATION OF RESEARCH

🔗 The effectiveness of Art Integrated Program developed by the researcher in the present study is depends on the student's response to the achievement test.

🔗 Age, gender, economic and social conditions of students and teachers in the present research is not under the control of researcher.

1.10 REVIEW OF RELATED LITERATURE AND PREVIOUS RESEARCH

Distinctiveness of Present Research: For the present research, the researcher has reviewed and studied the related information and previous researches, best reference materials. According to this, the uniqueness of the present research is given as follows:

1. Difference in Objectives: According to the previous researches it was found that there has been research on environmental awareness, but considering the scope of Mathematics subject, the study of the current status of Art Integration at the school level is the uniqueness of the present research.

The uniqueness of the research is that studying the effectiveness of Art Integration programme. The usefulness of the program was observed through the Mathematics teachers.

2. Distinctions about Research Methodology and Design: The uniqueness of the present research is that the product development, experimental method has been used and information has been collected through equivalent two groups. Experimental design has been chosen for the present research and Art Integration Programme was organised according to the objectives. For the present study (Pre-Test-Post-Test) two equivalent group research design selected. Researchers studied the effectiveness of Art Integration Program and the score are compared.

3. Differentiations in Terms of Research Tools: In the present research, information has been collected through various research tools. It is different from other research that includes questionnaire, pre-test, program development, post-test. The statistical tools used in the present research are percentage, mean, standard deviation, t test, Chi-Square test. Hence there is also a difference in research tools.

1.11 RESEARCH METHODOLOGY

Mixed Research Methodology has been used in the present research study. Survey method includes product development and experimental research method.

Objective 1: To study the present status of Art Integrated Education of VII std. Students.

Table No. 1

Objective No.	Research Method	Data Collection Tool	Selection of Sample Method	Sample	Statistical Tool
1	Survey Method	Questionnaire	Randomised-lottery method	Incidental sample (950)	Percentage

According to the Objective, the population is all the students of VII std. in secondary schools of English medium in Pune city, Maharashtra state. According to the number of the present population in the academic year 2024-2025, it was 9495. Out of that researchers select 10% sample for the present research. For the present research 950 students selected as a sample through Incidental sampling method for objective one.

Research Tool: Questionnaire- tested by education expert and Experiential Mathematics Teacher. The researcher has conducted pilot study.

Objective No. 2: To develop the Art Integrated Program for VII std. Mathematics subject.

The researcher developed the following process for Art Integrated program as per objective-

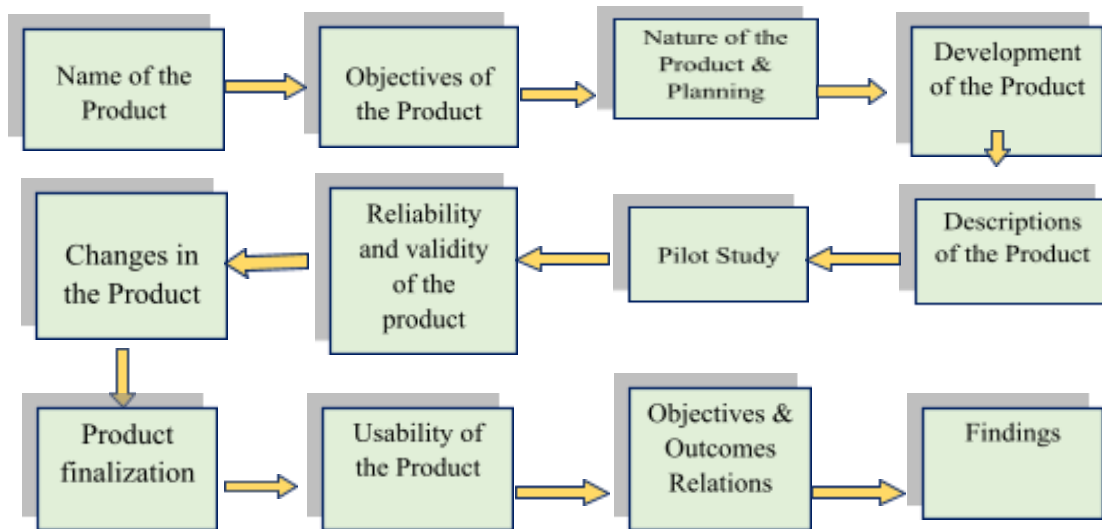


Chart 1- Product Development Process- Art Integrated Program

Researchers organised the Art Integration Program on VII Grade Mathematics students. The developed Art Integration Program was implemented on the Experimental group in school per day one hour for one consecutive month.

Objective No. 3 To define the effectiveness of Art Integrated Program for VII std. Mathematics subject.

Table No. 2

Objective No.	Population	Sampling Method	Sample	Information Collection Tool	Information Analysis Tool
3	950	Purposive Sample	60+60 (Control Group + Experimental Group)	Pre-Test, Art Integrated Program, Post-Test	Mean, SD, 't'-Test

For the present research objective 3, Researchers used the Experimental Method to define the effectiveness of the Art Integrated program. As per strategy mentioned in objective 2 for develop product, researchers implemented the product an experimental group for one month one clock hours per day and post test was conducted after the implementation of Art Integrated Program. To study the effectiveness of the program, there was total 30 questions in the post-test.

For the present research, pre-test - post-test equivalent two groups research design was used.

Pre experimental preparation-

- i.a According to Objective No 1. For the present research, a data collection tool 'questionnaire' was used. The purpose was to study the current status of Art Integration of the VII std. students. As per the received information through data collection tool 'questionnaire' researcher analysed and interpreted the available data information.
- i.b According to Objective No 2.- With the help of findings from survey and opinions from guide, subject experts, subject teachers, researcher finalised the Mathematics units from Std. VII Grade. Based on this, unit's researchers gives the validated pre-test to two equivalent groups.
- i.c Researchers studied the problems faced by the students after the pre-test. Researchers prepared the product based on Mathematics concepts and application of Mathematics elements. The product was finalised with the help of guide, educational experts, and Mathematics teachers. As per the pre-test analysis and interpretation researchers finalised the Art Integrated Program.
- i.d Art Integrated Program was developed for experimental group. While the control group followed the usual traditional method. Both the groups were given the post-test. The question paper of pre-test and post-test was kept the same.

Objective No. 3 -Research Methodology:

According to objective 3, researchers used the experimental method. Researchers conducted pre-test, for 120 students of VII std. of the school. 60 students was selected for the experimental group. The Art Integrated program developed and implemented on the experimental group for one month consecutively. 60 students were selected for the control group and the content was taught by the traditional method. After conducting Art Integrated Program on experimental group and traditional method to control group post test was conducted on both the groups of students. After that, a comparative study prepared of the post-test conducted on the control group and experimental group and the conclusions were drawn.

POPULATION:

The Objective No. 3 – The population of the present research study 950 English medium VII std. students of Pune city were selected as a population.

Selection of Sample: Two equivalent groups- Two group design was selected in such a way that the sample should be representative of all the characteristics. In the present research, the researcher adopted the same method of random sampling in the selection of the sample. Accordingly, 60 students of std. VII in the academic year 2024-2025 were selected for the experimental group and 60 students were selected for the control group.

RESEARCH DESIGN:

A pre-test, post-test (control group and experimental group) equivalent group design was used for the present research.

The following research design was followed. (*Best & Kahn. 2014*)

TWO EQUIVALENT GROUP RESEARCH DESIGN:

The researchers selected the equivalent group based on the mean of the pre-test scores. The pre-test was validated through pilot studies with the help of research guide and education experts. Equivalent two groups are based on the mean and standard deviation of the pre-test. Researcher studied the effectiveness of Art Integrated Programme on dependent variables for students' achievement.

DATA COLLECTION TOOLS:

Researcher selects the data collection tools with the help of Guide, Education experts, Informants, Mathematics teacher and prior references.

STATISTICAL TOOLS OF DATA ANALYSIS:

- a. Mean 2. Standard Deviation 3. 't' test

1.12 OBJECTIVE WISE OBSERVATIONS AND INTERPRETATIONS:

1.12.1 Observations and Interpretation of Objective 1 in Summary form:

- A. The researcher studied the present status of Art Integration of VII std. school students with the help of questionnaire.
- B. The information was received from the student's responses through questionnaire. The researchers mentioned the observation and interpretation in according to the sub objectives in the summary form.
- C. The researchers show the responses, observations and interpretations with the help of the following table-

Table No. 3

Art Integration- Study Mastery level by percent score in writing interpretations.

Table showing Learning Mastery Levels – (Ref. Bloom's-Learning Mastery Theory)

S. No.	Percentage of Respondents (%)	Learning Mastery level
1	0 to 20	Very low
2	21 to 40	Low
3	41 to 60	Approaching Mastery
4	61 to 80	Mastery
5	81 to 100	High Mastery

Table No. 4
Observations and Interpretations as per the Objective 1

Sub Objectives	Observations	Interpretations
1. To study the knowledge of Mathematical concepts of VII std. students. <i>(Bloom’s cognitive level 1)</i>	Researchers studied the student’s knowledge of Mathematical concepts of VII std. The percentage of correct answer is on average 48.90%.	Mathematical knowledge of students is average/moderate (Approaching Mastery)
2.To know the understanding of the Mathematical concepts. <i>(Bloom’s cognitive level 2)</i>	Researchers studied the students understanding of the interrelationship between Mathematical subject. The percentage of correct answer is on average 48.84%.	Students understanding the Mathematical concepts is average/moderate. (Approaching Mastery)
3. To study how the students apply the knowledge about Mathematical concepts. <i>(Bloom’s cognitive level 3,4)</i>	Researchers studied the, how students apply their knowledge of Mathematical concepts. The average current answer rate is 44.60%	The extent of applying knowledge gained from Mathematical concepts of the students is average/moderate. (Approaching Mastery)

Observations and Interpretations:

The information received from the above table is used for to develop a Art Integration program. Considering the nature of the program, content, elements, interaction selection of strategy, the Art Integration Program was developed. Art Integration Program was finalised with the help of the Mathematics subject teacher and educational experts.

1.12.2 Research Objective 3 - Analysis and Interpretation of Data:

To study the effectiveness of Art Integration Program for VII std. The students were selected from two different schools as experimental and control groups.

Descriptive statistics of the control groups are as follows-

1. Descriptive statistics-

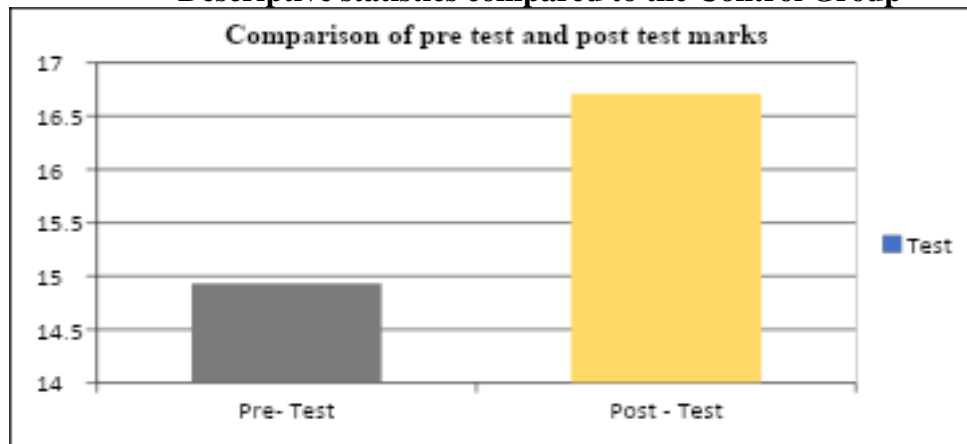
Table No. 5
Descriptive Statistics in the Control Group

Description	Pre – Test	Post – Test
N	60	60
Mean	14.40	16.50
Standard Error of Mean	0.25	0.24
Standard Deviation	1.92	1.89
Corelation Coefficient	0.82	
Mean Deference	1.65	

Observations and interpretation: Statistical analysis of pre-test of control group.

1. There was total 60 students in pre-test.
2. The mean of pre-test was 14.40 and the standard deviation was 1.92

Graph No. 1
Descriptive statistics compared to the Control Group



A pre-test and a post test of 30 marks were conducted for the selected sample group of 60 students. Researchers implemented the pre-test on control group. After that researchers used the traditional method for Mathematics teaching and then conducted a post test. Difference between the Mean of the pre-test and post-test was 1.70. The available information has been interpreted in a descriptive manner.

Descriptive Statistics in the Experimental Group:

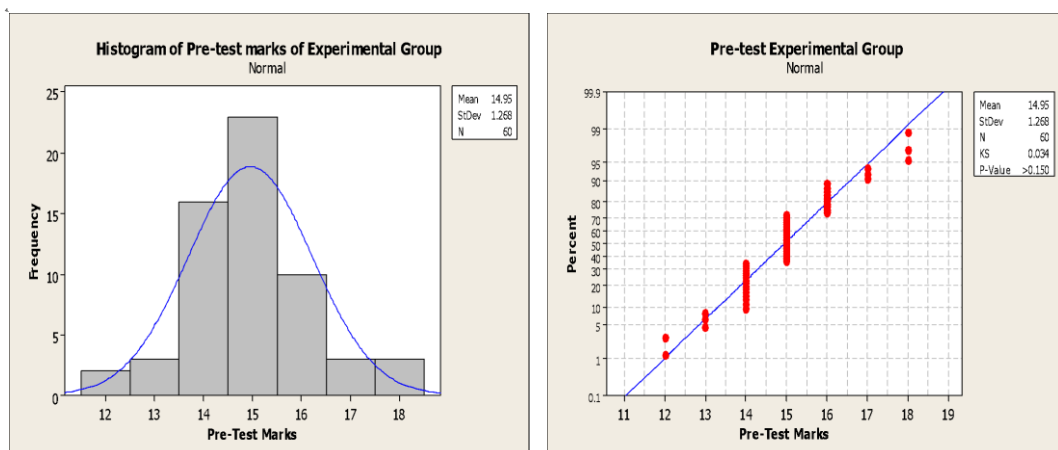
Table No. 6 Descriptive statistics in the Experimental group

Description	Pre – Test	Post – Test
N	60	60
Mean	14.90	21.18
Standard Error of Mean	0.16	0.27
Standard Deviation	1.26	2.14
Corelation Coefficient	0.49	
Mean Difference	6.28	

Observations and interpretation: Statistical analysis of pre-test- Experimental group

1. There was total 60 students in pre-test.
2. The mean of pre-test was 14.90 and the standard deviation was 1.26.
3. Normality Testing

Graph No. 2



Observed Normal Value: Pre-test marks for experimental group are normally distributed.

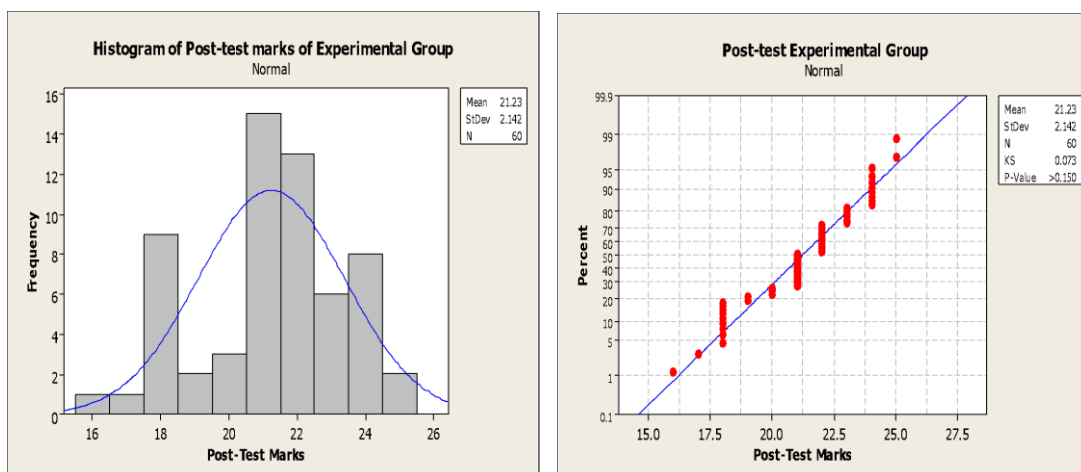
From the above graph, the distribution is slightly deviated from normal, but this distribution is in a straight line. That is the distribution is very close to normal.

Statistical analysis of post-test in Experimental Group:

Observations and Interpretation:

1. There was total 60 students in post-test.
2. The mean of post-test was 21.18 and the standard deviation was 2.14.
3. Normality Testing

Graph No. 3

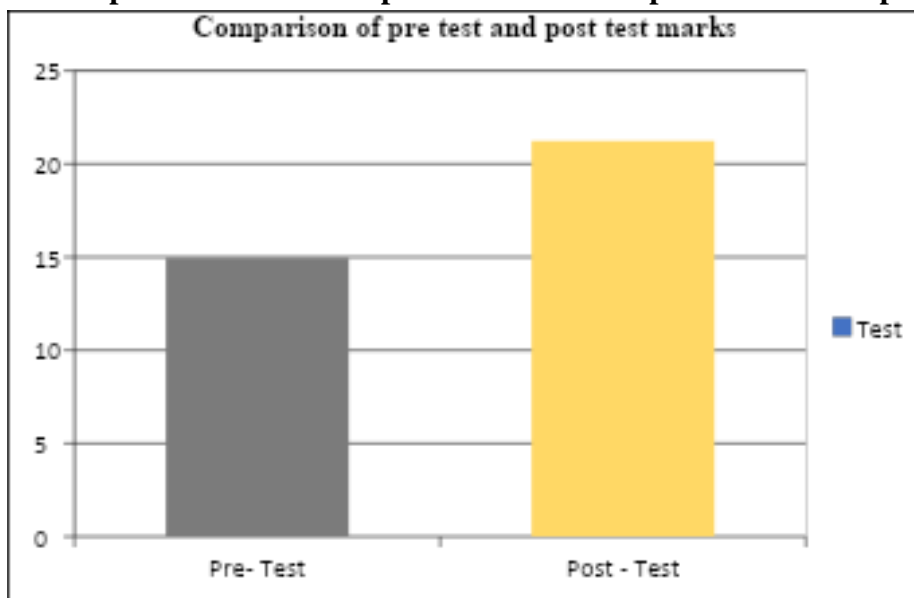


Observed Normal Value: Post-test marks for experimental group are normally distributed.

From the above graph, the distribution is normally deviated from normal at the lower and upper ends. But the distribution is in a single straight line. That is this distribution is very close to normal.

Graph No. 4

Descriptive Statistics Comparison between Experimental Groups



A pre-test and a post test of 30 marks were conducted for the selected sample group of 60 students. Researcher conducted the pre-test on Experimental group. After that researcher implemented the Art Integrated Program and then conducted a post test. Difference between the Mean of the pre-test and post-test was 6.28.

The available information has been interpreted in a descriptive manner.

Statistical Analysis and Interpretation of Post-Test in Control Group and Experimental Group:

Table No. 7

Comparison of Post-test between Control group and Experimental group

Description	Post – Test (CG)	Post – Test (EG)
N	60	60
Mean	16.70	21.20
Standard Error of Mean	0.24	0.27
Standard Deviation	1.92	2.14
Corelation Coefficient	0.08	
Mean Deference	4.51	

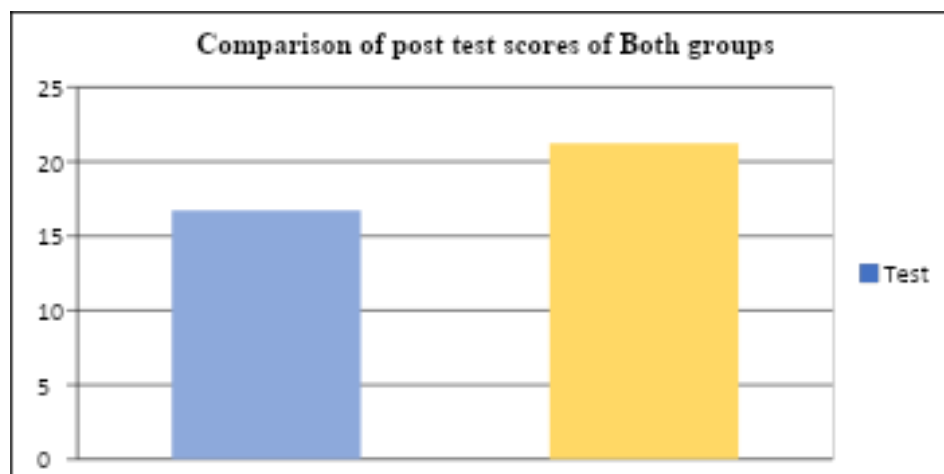
Observations and Interpretation:

Statistical analysis of Post-test of Control group and Experimental group.

1. Both the groups had a total 60 students of the post-test.
2. The post-test mean of the control group was 16.70 and the mean of the experimental group was 21.20.
3. The mean difference between the two groups was 4.50.

Graph No. 5

Descriptive Statistics Comparison of Post-test between Control Group and Experimental Group



Researchers implemented the traditional method for control group and Art Integrated Program for experimental group. Then post-test of 30 marks for both groups were conducted.

Inferential Statistics:**Table No. 8**

't' test of Statistical information of equivalent to sample control group and experimental group (pre-test)

Group	No. of Students	Mean	Standard Deviation	Paired 't' Value df = 59	Table 't' Value 0.05 Level	Significant/ Not Significant
Control Group (30 Marks)	60	14.40	1.97	0.057	2.00	Not Significant
Experimental Group (30 Marks)	60	14.90	1.26			

Observations and interpretation

From the above table it is observed that the obtained 't' value is 0.057. Table value for df= 59 is 2.00. Obtained 't' value is less than table 't' value at 0.05 significant level. Which means that there is no significant difference between the mean score of control group and experimental group. Which means that both the groups are similar in terms of achievements of Art Integration Program.

1. Research Hypothesis: H1- There is a significant difference between mean score of pre-test and post-test of experimental group for selected components of VII std. Mathematics for Art Integrated program.

2. Null Hypothesis: H01- There is no significant difference between mean score of pre-test and post-test of experimental group for selected components of VII std. Mathematics for Art Integrated program.

Table No. 9**Statistical analysis of pre-test and post-test of the experimental group**

Group	No. of Students	Mean	Standard Deviation	Paired 't' Value df= 59	Table 't' Value 0.05 Level	Significant/ Not Significant
Pre-Test (30 Marks)	60	14.90	1.92	26.03	2.00	Significant
Post-Test (30 Marks)	60	21.20	2.14			

Observations and interpretation:

From the above table it is observed that the obtained 't' value is 26.03. Table 't' value for df= 59 is 2.00. Obtained 't' value is greater than 2.00. Obtained 't' value is greater than table 't' value at 0.05 significant level. Which means that there is a significant difference between the mean score of pre-test and post-test of experimental group. Which means that the Art Integrated Program was effective.

That means Null Hypothesis is rejected and Research Hypothesis is accepted.

1. Research Hypothesis:

H2- There is a significant difference between mean score of post-test after the development of Art Integrated program to the experimental group and traditional method of teaching to control group for the selected components of the subject of Mathematics in VII std.

2. Null Hypothesis-

H02- There is no significant difference between mean score of post-test after the development of Art Integrated program to the experimental group and traditional method of teaching to control group for the selected components of the subject of Mathematics in VII std.

Table No. 10

**‘t’ test of Equivalent two samples- Control group and Experimental group-
Post-test statistics-**

Group	No. of Students	Mean	Standard Deviation	Paired ‘t’ Value df= 59	Table ‘t’ Value 0.05 Level	Significant/ Not Significant
Control Group (30 Marks)	60	16.70	1.92	12.70	2.00	Significant
Experimental Group (30 Marks)	60	21.20	2.14			

Observations and Interpretation:

From the above table it is observed that the obtained ‘t’ value is 12.71. Table ‘t’ value for df = 59 is 2.00. Obtained ‘t’ value is greater than 2.00. Obtained ‘t’ value is greater than table ‘t’ value at 0.05 significant level. Which means that there is a significant difference between the mean score of post-test of control group and post-test of experimental group. Which means that the Art Integrated Program was effective.

That means Null Hypothesis is rejected and Research Hypothesis is accepted.

1.13 RESEARCH FINDINGS

The main key points of the research are as follows:

Main Result:

1. The present research is useful for the study of present status of the Art Integrated Education of VII std. students. Mathematical concepts, and application of knowledge gained in the Mathematical subject.
2. The development of Art Integrated Program for VII std. students has significantly increased the students’ achievement. The Art Integrated Program has been effective.

1.14 CONCLUSIONS ACCORDING TO THE OBJECTIVES OF THE RESEARCH

The researchers has arranged the conclusions according to the objectives-

Objective No. 1. To study the present status of Art Integration of VII std. students.

Conclusion: 1. Knowledge of the Art Integration of VII std. students, for understanding the

study of Mathematical concept and application of knowledge gained from Mathematics was of approaching mastery level.

Objective No. 2. To develop Art Integrated Program for VII std. Mathematics Subject.

Conclusion: 1. Art Integrated Program was developed on Mathematics for VII std. Students, present Art Integrated Program was based on Mathematics Subject of VII Std.

Objective No. 3. To define the effectiveness of Art Integrated Program for VII std. Mathematics Subject.

Conclusion:

1. There is a significant difference between mean score of pre-test and post-test of experimental group for selected components of VII std. Mathematics for Art Integrated Program. It was found that, there is significantly remarkable difference between pre-test and post-test score.
2. Experimental group and control group were compared through post-test mean score. It was found that the mean score of Experimental group was greater than the control group.
3. After implementing the Art Integrated Program to the experimental group and teaching through traditional methods to the control group for the selected components of the VII std. Mathematics subject, there was a significant difference in the mean scores of the students in both the groups. That means the Art Integrated Program was effective.

1.15 EDUCATIONAL CONTRIBUTION OF RESEARCH

1. The contribution of the present research is to understanding and developing the concepts of Mathematics through Art Integrated Program for school students.
2. The contribution of the present research is to develop the Art Integrated Program focused on ‘the knowledge contribution and the Mathematical application.’
3. The contribution of the present research is to make the students proactive through Art Integrated Program. To develop and enhance the concepts of understanding the Mathematical concepts of school students through Art Integrated Program.
4. The contribution of the present research is to study the development Art Integrated Program by considering the cognitive and social conditions of the students based on psychological theories.

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