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EFFECTIVENESS OF ART INTEGRATED LEARNING IN HOLISTIC DEVELOPMENT OF MIDDLE - STAGED STUDENTS -NEP2020

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Abstract : *The present aims to examine the effect of art integration in science subject to holistic development of middle-staged students. The aim of Art Integrated Learning is to connect with the mind, heart and body of the learner and that it allows students to build and show understanding in many ways. Art Integrated Learning is holistic, joyful and experiential, and when cognitive outcomes changed, curriculum associated outcomes and learning process outcomes also changed, thus a holistic pattern can obtain. In our new policy NEP-2020 art integration in science and other subjects is recommended. So, it has become essential to investigate that when Art is integrated with science subject, it really helps the child to enhance their knowledge for a deeper understanding of the concepts. So, for study an experimental method with sample of 30 students selected through random sampling from government school of middle-staged students from Palwal district of Haryana for the study. Data were collected by using tools of art integrated lesson- plan, questionnaire. Two groups from sample were taken as control group and experiment group. Independent variables are teaching methods that is art – integrated and conventional method of teaching. Dependent variables are creativity and academics of students. Controlled variables are grade, board of school and age of students. For data analysis mean, standard deviation, t- test, ANOVA was used to compare controlled and experiment group from sample. This study investigated achievement, creative thinking and extended analysis to conceptual, analytical and enquiry and reflective outcomes. The findings revealed that art integration has positive impact on students' creativity and academic achievements of students. That means art integration help in holistic development of child as creativity enhance conceptual and mental health of students. The study concludes that art integration learning is a tool to help in holistic development of students and the implementation of art integrated science teaching is a good way to be used in the science learning process for students in the middle stages. This study helps in positive implication of art integration in science subject and NEP-2020.*

Key words: *Art - integration, science pedagogy strategy, Variables, learning outcome, student -centered curriculum, NEP-2020.*

1. INTRODUCTION :

Art integration with science broadens the mind of students and enables students to see the multidisciplinary connections between the subjects. Arts integration is a pedagogy whereby students engage in learning subject matter through the arts. Integration basically deals with the combination of various parts to make a unified whole, so art integrated learning means the combining art with various curricular areas for meaningful learning. Science is closely related to arts even though it can be said that science can teach easily and joyfully with the use of art related activities. Art education encourages sensory learning and provides a foundation to work with ideas. It focuses on non-verbal communication by face expressions whereas art integrated education is where art is put at the centre of the curriculum and all learning revolves around it for the development of body, mind and heart. Art integrated learning is a way to explorations of multiple intelligence of the child and role of it in effective, joyful and meaningful learning. NEP 2020 suggests that "the learning in the preparatory class shall be based primarily on play-based learning with a focus on developing cognitive, affective, and psychomotor abilities and early literacy and numeracy. Therefore, it can be concluded that through the integration of appropriate activities of art, science can be made easier and more interesting to understanding of concepts of science.so this discussion arouses thought of how art integration in science affect student's achievements.

2. Literature Review -NCERT in its Art Integrated Learning Guidelines (2019) stated that Art Integrated Learning (AIL) is a framework of experiential learning that provides an equitable environment for all students to learn at their own pace and they can construct their own knowledge with the support of art integrated activities provided to them.

CBSE (2019) recommends Art Integration is a cross-curricular approach based on a collaboration between the teaching the core curricula with the teaching of different Art forms (Visual/ Performing) where different Art forms act as a primary pathway to deliver the teaching content .
Qualitative Study' conducted by Prince (2020) is based on a qualitative study conducted in a CBSE school in Assam using ethnographic methodology to analyse and appreciate the practical implication of art integration at primary and secondary education levels.
Corbett (2019) in the study 'Influence of a drama-based education program on the development of empathy in year 10, Western Australian students' tried to understand which elements of the drama processes are most conducive to increasing empathy in adolescents. Findings of this research showed a significant increase in participants' empathy, which highlights the potential for drama to improve student empathy.
An empirical article by Hardiman, Johnbull, Carran, and Shelton (2019), studied the effects of arts-integration on student memory retention of science concepts. The randomized controlled trial was conducted using 350 students from 16- fifth grade classrooms across six schools that showing that arts-integrated curricula that include visual and performing arts-such as dance, tableau, singing, and drawing-significantly boost memory retention in students with lower reading abilities, highlighting its potential to enhance their academic performance and engagement.

A case study conducted by Shouma (2020) in one of the schools in the UAE to examine the impact of Art Integration on the academic and social development of 4 elementary students with different disabilities indicated that Art Integration has indeed a positive impact on the academic and social development of students with disabilities; i.e. on their confidence, self-expression, and excitement to show their knowledge of basic arts skills.

Research conducted by Sudhir (2021) at NCERT and objective was to Study Learning environment in primary schools practising Art Integrated Learning in School had more than one AIL trained teachers, were a part of 10-day face-to-face training, followed up by periodic handholding, and where the Heads of School were oriented on AIL pedagogy—were able to implement the AIL approach effectively and performed significantly better than other schools. Those schools had the students who demonstrated an excellent participation in day-to-day organisation of AIL activities and exhibited a greater sense of responsibility in school events, such as morning assemblies, Bal Sabha, Science and Art fairs, etc., as compared to other schools.

Teaching science through the arts with STEAM lessons is an effective approach if curriculum designers are concerned about equity building (Corrigan et al., 2022). Introducing STEM units with STEAM may also effectively improve the outcomes for teaching life and physical sciences with the STEAM first-order effect advantage.

The Kennedy Centre's Changing Education through the Arts (CETA) initiative claims that there are variations in how art integration is taught in the classroom. "Arts as Curriculum, Arts-Enhanced Curriculum, and Arts-Integrated Curriculum" are the three variants. While art is utilized as a tactic to support other curriculum areas in the Arts-Enhanced Curriculum, students gain knowledge and skills in a specific art form in "Arts as Curriculum." However, in the "Arts-Integrated Curriculum," learning is facilitated by the arts. So, by literature review we can conclude that art integration effect learning and can include in curriculum.

3. Methodology

Research Method: Quasi Experimental Research Method will be used in the present study and the Two group Nonequivalent pretest post-test design will be used in the present study.

Population: Multi-Level Mixed Method Sampling will be used by the researcher. Mixed Method Sampling involves combining probability and non-probability sampling techniques in creative ways to answer research questions. Population of the Study will be 9th Grade Students of govt. School from Palwal of Haryana state.

The Sample: In the proposed research approximately 30 Students of 9th class will be selected as sample of the present study.
Sampling Technique: The researcher will employ Stratified Sampling technique of probability sampling to decide the sample on proportionate bases. Sampling will be used for assigning the Sections as Experimental and Control group. School and class selection by random sampling .class section by intact sampling. Assign section as control and experimental group in which experiment group- 15 and control group -15. So total number of samples is 30 students.

Hypothesis -

1. There will be no significant effect of art integration in science teaching on academic achievement of middle-aged students.
2. There will be no significant effect of art integration in science teaching on creative thinking of middle-aged students.

Tools- Lesson-plan, Questionnaire

Independent Variable: Teaching method- Art Integrated Method and Conventional Method

Dependent Variables: Creative Thinking and Academic Achievement

Controlled Variables: Age, Grade, Board

Descriptive Statistics: Mean, Standard Deviation, Inferential Statistics: Analysis of Covariance (ANOVA) will be used for comparison between control and experimental group differences by controlling covariate effect.
t-test will be used to test whether there is difference between the meaning of two groups is statistically significant or not. Differences in academic achievement were also ascertained by 't'-Test and two-Way ANOVA.

Procedure- For data collection
Data was collected from Government school of Palwa**l** with samples of 30 students of 9th class. One group of 15 students was experimental group and other group of 15 students was control group of 9th class. Pretest was done on 30 students. Then Experimental group was taught with art integrated method and control group with conventional method of teaching. Experimental group done art integrated activity. After that post-test was done of both groups -experiment and control group. Pretest was given for the students. Then Experimental group was taught cell and its organelle lesson with art integrated method and control group with conventional method of teaching. Experimental group done making of diagram 3d model and role play in art integrated activity. After that post-test was done of both groups -experiment and control group.

Data analysis- Total marks-30 of post test
Question of creativity -01 (marks-05)
Total questions-25-(marks-30)
Total number of students-30

4. DATA ANALYSIS -

Hypothesis1- There will be no significant effect of art integration in science teaching on academic achievement of middle-aged students.

Academic Achievement			
Exp grp		Control grp	
S.no	Marks	S.no	Marks
1	27	1	22
2	27	2	21
3	26	3	21
4	25	4	20
5	25	5	19
6	24	6	18
7	22	7	17
8	22	8	16
9	21	9	15
10	21	10	14
11	21	11	13
12	18	12	12
13	18	13	11
14	17	14	9
15	16	15	8

Summary Statistics -

Sample Size (N)	15	15
Mean ($\bar{X}$)	22	15.7333
Standard Deviation (SD)	3.6253	4.4955

To determine if there is a statistically significant difference between the means of the two independent groups, we conduct a

T- test-:

- **Degrees of Freedom (df):** $N_1 + N_2 - 2 = 15 + 15 - 2 =$ **28**
- **Pooled Standard Deviation (*sp*): 4.0825**
- **t-Statistic (t): 4.2026**
- **Two-Tailed p-value (p): 0.0002**

1 Statistical Interpretation -
Since the p-value (0.0002) is significantly less than the standard significance level ($\alpha = 0.05$), the difference between the academic achievement scores of the experimental group and the control group is **highly statistically significant**. The experimental group achieved a noticeably higher mean score.

So, we can say that there will be no significant effect of art integration in science teaching on academic achievement of middle-aged students' hypothesis is rejected.

ANOVA Summary Table One-Way ANOVA Results

Source of Variation	SS	df	MS	F	p-value
Between Groups	294.536	1	294.536	17.662	0.00024
Within Groups (Error)	466.932	28	16.676		
Total	761.469	29			

Grand Mean = 18.8667

Interpretation
Since **p = 0.00024 < 0.05**, the difference between the experimental and control group means is **statistically significant**
2 Hypothesis- There will be no significant effect of art integration in science teaching on creative thinking of middle-aged students.

Creativity Marks			
Exp grp		Control grp	
S.no	Marks	S.no	Marks
1	5	1	4
2	5	2	3
3	5	3	3
4	5	4	3
5	5	5	3
6	5	6	3
7	4	7	2
8	4	8	2
9	4	9	2
10	4	10	2
11	3	11	1
12	3	12	1
13	3	13	1
14	3	14	1
15	3	15	1

Descriptive Statistics Summary

Metric	Experimental Group (exp group)	Control Group (control grp)
Sample Size (N)	15	15
Sum ($\sum X$)	330	236
Mean ($\bar{X}$)	**22**	**15.7333**
Sample Variance (s^2)	13.1429	20.2095
Standard Deviation (SD)	**3.6253**	**4.4955**

An independent t -test-with equal variances assumed evaluates the difference between the two group means:

- **Degrees of Freedom (df):** $N_1 + N_2 - 2 = 15 + 15 - 2 =$ **28**
- **t-Statistic (t): 4.2026**
- **Two-Tailed p-value (p): 0.0002**

Statistical Conclusion - Because the calculated **p-value (0.0002)** is much smaller than the standard significance threshold ($\alpha = 0.05$), reject the null hypothesis. The difference between the creative thinking achievement scores of the experimental group and the control group is **highly statistically significant.**

One-Way ANOVA

Source	SS	df	MS	F	p-value
Between Groups	261.67	1	261.67	15.68	0.0005
Within Groups	467	28	16.68		
Total	728.67	29			

Result: F (1, 28) ≈ 15.68, p ≈ 0.0005

Since **p < 0.05**, the difference between the experimental and control group means is statistically significant.

So, from above calculation and data analysis it is concluded that art integration is important for teaching – learning process. Art – integration is recommended and change in curriculum is demand in new policies of NEP-2020.

5. Conclusion :

So, this study concluded that art integration in science helps in holistic development of students as recommended by NEP-2020. Areas for art integration in science focus on fostering deeper understanding through experiential learning by connecting abstract concepts to tangible artistic expressions like models, portfolios, or performances. Key applications include enhancing student engagement, cultivating critical thinking and creativity, developing problem-solving skills. Students from experiment group score more marks in test as compared to control group. Out of 30 marks one question of 5 marks was of creativity question in which student had to draw cell and its organelles diagram showing difference between them. Experiment group which was taught by art integration method were good in creativity as 10 students scored more than 3 marks learn in experiment group as they are good in making diagram of cell and its organelles. But in control group 6 student scored more than 3 marks in creativity question. This proves that art integration is needed to develop creativity among students. Out of 30 marks of test, 11 students from experiment group scored more than 20 marks and 4 students from controlled group scored more than 20 marks. So, we can conclude that art integration has positive impact on students that's why NEP-2020 recommended it in school curriculum. For implications of new policy, rules and recommendations it's needed to investigate, experiment and examine that policy. So, this study helps in implications of art integration in science subject in NEP-2020 by investigating it by use experiment method and also recommend that art integration should be used to teach science subject to boost students' interest, creativity, critical thinking and academic achievements or we can say help in holistic development of child.

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