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ABSTRACT

The purpose of this study was to assess the effects of an innovative art education program that was piloted in two elementary schools in Wichita, Kansas in 1987. Two questions were addressed: (1) Does instruction in art by a qualified art teacher produce increased learning of the content of art? and (2) Does art instruction emphasizing thinking skills have positive effects on student learning? Four major areas of instruction were addressed in the experimental art program: design concepts and expressive art production, critical and appreciative learning in art, cultural and historical aspects of art, and creative problem solving. Two teachers with certification in art education were assigned to the experimental schools. The teachers met with students in grades 1 through 6 for 1 hour each week. Lesson plans were designed to teach art concepts with an emphasis on higher level thinking skills. In addition to analysis, synthesis, and evaluation, students were involved in activities requiring transformation, causation, focus, visualization, tolerance, elaboration, and divergent thinking. The experimental group consisted of fourth, fifth, and sixth grade students; the control group consisted of students receiving art instruction from regular classroom teachers. Results indicated that instruction in art by a qualified art teacher produces increased learning in the content of art. Findings concerning student achievement were inconclusive. (RH)

"BEYOND LOLLIPOP TREES": TEACHING THINKING SKILLS THROUGH ART

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INTRODUCTION

Within the past decade, art education has sought to redefine its role in the curriculum. Art was long seen as a frill; a realm of emotion, mystery and intuition. The new emphasis on discipline-based art has highlighted the cognitive aspects of the field that have traditionally been associated with science and problem-solving. Today, the lines between the affective and the cognitive are not that clearly delineated (Gardner, 1988).

Through art, students learn to work together, to express themselves and to make decisions. Art classes provide an opportunity for exploratory activities that foster creativity. Aesthetic education provides a variety of images that help make comprehension of concepts easier. This, according to Lawton (1987), contributes to language mastery and aids in the development of mathematical processes. Learning experiences in art evolve into inductive problem solving that foster the development of higher level thinking skills (Kuykendall & Regan, 1985). Furthermore, an effective background in all areas (including art) enhances one's perspective and broadens a person's potential learning base.

Several programs have demonstrated the effect that art education can have not only on teaching students the content of the field but on improving their thinking skills and academic achievement. Four years of Arts IMPACT in a Columbus, Ohio elementary school led to significant gains in the reading and math scores of sixth graders. Specifically, there was a 65 percent increase in students scoring above grade level in reading vocabulary and a 41 percent increase in reading comprehension. In arithmetic computation and concept development gains of 56 and 63 percent were registered (Lawton, 1987). In Houston's art-centered elementary magnet schools, average percentile ranks on the Iowa Test of Basic Skills ranged from 52 to 78 percent during the academic year 1982-83 (Kuykendall & Regan, 1985). As a result of "Thinking Through the Arts", a comprehensive arts in education program implemented in New Rochelle, New York, students made significant gains on tests of thinking skills, creativity and art vocabulary. It should be noted that these and other programs achieved success regardless of the ethnic composition or socioeconomic level of the students.

The purpose of this study was to assess the effects of an art education program that was piloted in two elementary schools in Wichita, Kansas. The following questions were addressed:

1. Does instruction in art by a qualified art teacher produce increased learning in the content of art?

2. Does art instruction emphasizing thinking skills have positive effects on student learning?

BACKGROUND

Like many other school districts, USD 259 had no elementary art program. Instruction in art was provided by the regular classroom teacher who is generally not certified in art education. The art department provided district objectives and two art specialists worked with teachers to develop materials and plan lessons. There were no restrictions on the frequency of instruction or classroom activities.

In 1987, several factors converged and led to the implementation of an experimental program in two Wichita elementary schools. The first was an awareness of the importance of developing higher level thinking skills in our students. The old basics no longer suffice to prepare students to work and live in the continuously changing world of tomorrow. Learning to learn is essential. The second factor was a reexamination of the district's art program in light of recent developments in the field. There was an interest in making the program more discipline-based and in developing methods for evaluating student learning. Finally, a supportive (and vocal) parent group requested the program and worked with teachers and administrators to implement it. It was the belief of all those involved that, like other areas in education, children's visual symbols do not develop unless motivated, stimulated and instructed. Quality art instruction should seek both critical and creative thought, propelling students past the common place and trite, "Beyond Lollipop Trees".

The result was that an experimental art program emphasizing thinking skills was implemented in Gammon and Cloud Elementary Schools. Four major areas of instruction were addressed in "Beyond Lollipop Trees": 1) design concepts and expressive art production, 2) critical and appreciative learning in art, 3) cultural and historical

aspects of art and 4) creative problem solving. Two teachers with certification in art education were assigned to the experimental schools. The teachers also had some background in teaching higher level thinking skills through art and experience in developing an elementary art curriculum. The teachers met with students in grades 1-6 for one hour every week. The art education department of USD 259 provided the teachers with ten lesson plans for each grade. The lesson plans were designed to teach art concepts with an emphasis on higher level thinking skills. In addition to analysis, synthesis and evaluation, students were to be led in activities requiring transformation, causation, focus, visualization, tolerance, elaboration and divergent thinking. The goal was for students to become comfortable with the process of independent thinking and to accept responsibility for themselves, their attitudes and their achievements. The teachers were to use the lesson plans as guidelines for instruction modifying them according to the situation. (See Appendix A for sample lesson plans).

METHOD

This study utilized a non-equivalent control group design to test the following two null hypotheses:

H1: There is no significant difference between art learning of students in the art education program and art learning of students in the regular program.

H2: There is no significant difference between academic achievement of students in the art education program and academic achievement of students in the regular program.

The experimental group consisted of fourth, fifth and sixth grade students at Gammon and Cloud Elementary Schools. The control group consisted of students at Peterson, McCollum and Colvin Elementary Schools who were receiving instruction in art from the regular classroom teacher. These schools were chosen because they serve students of the same socioeconomic level as the experimental schools. Socioeconomic level was determined by the percentage of students in the school who qualify for free and reduced lunches.

Learning of art content was assessed by three multiple choice tests (one for each of grades 4, 5 and 6) prepared by the art education department of the Wichita Public Schools. The tests were based on the goals and objectives of elementary art in the district and measure achievement in

art appreciation, concepts, history and problem solving. (See Appendix B). The Kuder-Richardson reliability of the tests was 0.676, 0.798 and 0.684 for the 4th, 5th and 6th grade tests, respectively. The tests were administered in the fall of 1987 and the spring of 1988. Pretest-posttest gains operationally define art learning in this study.

Gains in the grade-equivalent composite scores on the Iowa Test of Basic Skills were used as a measure of academic achievement. The GE composite score is the arithmetic average of the following GE scores: vocabulary, reading, language arts total, work study total and math total. Since the ITBS is administered districtwide in March of each year, spring-spring gains were utilized.

Mean gains in art and ITBS were analyzed using the t-test for independent samples.

RESULTS

Hypothesis One

The results of the t-test were highly significant for all three grade levels indicating that students in the experimental program learned a lot more about the content of art than students in the regular program.

Table 1
Gains on Test of Art Content
Fourth Grade

	Experimental Group	Control Group
N	98	100
Mean Gain	16.33	8.56
SD	15.37	14.56
t-value	3.56	
degrees of freedom	196	

significant at $p < 0.0003$ level.

Table 2
Gains on Test of Art Content
Fifth Grade

	Experimental Group	Control Group
N	100	100
Mean Gain	12.74	4.24
SD	15.51	14.15
t-value	4.05	
degrees of freedom	198	

significant at $p < 0.0001$ level.

Table 3
Gains on Test of Art Content
Sixth Grade

	Experimental Group	Control Group
N	34	55
Mean Gains	18.04	-2.66
SD	11.07	15.10
t-value	7.22	
degrees of freedom	87	

significant at $p < 0.0001$ level.

Hypothesis Two

The results of the t-test were not significant for grades 4 and 5, but were significant at the 0.01 level for grade 6. For fourth and fifth graders, there was no significant difference in academic achievement between students in the experimental art program and those in the regular program. Sixth graders in the experimental program showed a higher mean gain in the ITBS composite GE scores than other sixth graders.

Table 4
Gains in ITBS Composite GE Scores
Fourth Grade

	Experimental Group		Control Group
N	80		87
Mean gain	10.69		10.75
SD	4.54		4.71
t-value		-0.08	
degrees of freedom		165	

not significant.

Table 5
Gains in ITBS Composite GE Scores
Fifth Grade

	Experimental Group		Control Group
N	76		85
Mean gain	10.59		10.13
SD	3.91		4.53
t-value		0.69	
degrees of freedom		159	

not significant.

Table 6
Gains in ITBS Composite GE Scores
Sixth Grade

	Experimental Group		Control Group
N	28		45
Mean gain	13.68		10.36
SD	5.61		4.60
t-value		2.76	
degrees of freedom		71	

significant at $p < 0.01$ level.

DISCUSSION

The results show that instruction in art by a qualified art teacher produces increased learning in the content of art. Students in the experimental program demonstrated more growth in their knowledge of art concepts, history and criticism than other students. The quantity and quality of art instruction that is provided by the regular classroom teacher is a function of his/her own interests and abilities. Lacking any background in art education or systematic knowledge of the discipline, the regular classroom teacher will tend to emphasize art production. Awareness of district art objectives does not influence instruction greatly since teachers are not held accountable for these objectives.

The multiple choice tests developed in this study were an attempt to establish an accountability measure for art education. One obvious limitation is that they fail to test for student creative and productive abilities in art. This is spite of the fact that the Wichita program places special emphasis on these areas. The tests also suffer from a common weakness of teacher-made multiple choice tests: the questions, for the most part, require lower-level thinking skills such as knowledge and comprehension. In order to provide a more complete picture of the educational outcomes of art instruction, these tests need to be augmented by observation, interviews, essays, visual identification tests and attitude measurement scales (Day, 1985). In their current form, however, the tests show that students in the experimental program are progressing towards gaining an understanding of the nature and processes of art.

The effect of the Wichita art program on the academic achievement of students was harder to ascertain. "Beyond Lollipop Trees" places special emphasis on developing higher level thinking skills. Increased problem solving and analytical abilities are expected to lead to better learning and higher test scores. These relationships have been shown after several years of art programs. The fact that this evaluation took place at the end of the first year of a program that involved one hour of instruction per week may account for the inconclusive results. Another issue is whether growth in thinking skills would necessarily be reflected in ITBS scores. Swartz (1987) writes that researchers differ on the transferability of thinking skills with some arguing that such skills must be taught and used only within a particular discipline. The development of an attitude that supports such thinking is seen by some as a precondition for successful transfer. Hence, it is difficult to draw conclusions about direct relationships between the art program's first year and achievement scores.

This study underscores the positive effects of having a special art teacher in the elementary classroom. It also raises questions about current teacher preparation programs. In order to teach higher level thinking skills, the teachers themselves need to be comfortable with the processes involved and able to transmit them to students. Colleges of education need to address this matter not only for art teachers, but for anyone expected to prepare students for the future.

The results of this study merit further exploration. Higher level thinking skills are a necessity if students are to adapt to and act upon the fast-changing world that awaits them. The possibilities offered through art education for refining the learning tools of students cannot be ignored.

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APPENDIX A

Course: 4 Unit: Thinking Skills Art History Lesson: 9 Title: Peaceable Kingdom

CONCEPTS	SUGGESTED TEACHER ACTIVITIES
We visualize as we read or listen to verbal communications. The artist may create art to: 1) invent or design 2) tell a story or record an event 3) enhance or decorate 4) for religious reasons 5) express personal knowledge	FOCUS OR MOTIVATION: Look at the painting Peaceable Kingdom by Edward Hicks. As you look the teacher will read a poem by the artist.
OBJECTIVES The student will demonstrate an understanding of the visualizing process imagination and illustration. The student will analyze a painting, hear about the life of the artist and speculate what his goal for his artwork might have been. Why create art? (The artist may have several reasons.)	INSTRUCTIONAL: After the poem has been read once, read the poem again line by line and have the children point out the illustration of the poem in the picture. Why did the artist paint all these animals living together? Why aren't the children afraid to play among the wild animals? Do you think Peaceable Kingdom is a good title? Why? What do you think William Penn and the Indians are doing? How can you tell this is a peaceful meeting? Describe your favorite animals. How many animals can you name? Did the artist overlap the shapes of animals? Where did you see contrasting colors? Where do you see interesting patterns? Which animals are the center of interest? How did the artist make these animals more important? Do the words of the poem help consider additional meaning for the picture?
	MODELING: Demonstrate how you might use visualization. Describe a peaceful, quiet scene; perhaps ducks gliding softly across the water, or a sailboat on a quiet lake, or a field of flowers blowing softly in the breeze. It might be an inside scene - a warm fire on a cold night or raindrops on the window. Close your eyes and use your imagination to "see" what you hear.
VOCABULARY visualization illustration	HELPFUL HINTS: Use the Feldman model as reference for art criticism. A light spray of hairspray or fixative will help keep the chalk from smudging. Placing newspaper between pictures also prevents smudges.

SUPPLIES/TOOLS/EQUIPMENT	STUDENT ACTIVITIES
-light colored construction paper -white chalk -colored chalk (or crayon) -hair spray or fixative reproduction	1) After visualizing some quiet scenes without discussion we want to draw a peaceful scenes - titled My Peaceable Kingdom. 2) Sketch your idea in white chalk lightly until you are pleased with your sketch. 3) Add color to your picture. If you use the pastel or light colors your picture may "feel" more peaceful. Bright colors are exciting. They might not make a very peaceful picture. 4) Practice on a newspaper different chalk strokes to use to communicate different kinds of texture; short lines, wavy lines, dots, or thick-thin lines. Practice laying one stroke of one color next to strokes of another. This is particulary helpful when adding color and texture for grass, foliage, etc. Remember, our eyes will blend the colors.

RESOURCES	EVALUATION	ALTERNATIVE/SUPPLEMENTAL ACTIVITIES
Through a Child's Eye- Williamson & Zellers Hicks, Peaceable Kingdom E. Goldstein	1. Did the student demonstrate an understanding of the visualization process and illustration? 2) Did the student analyze the painting, discuss the artist and consider what his goal for the artwork might have been? 3) Did the student discuss why the artist creates?	Students might write a story about The Peaceable Kingdom, what that might be, how our world might be different, creating a series of illustrations or images and compiling them into a small book.

APPENDIX B

ELEMENTARY ART FIELD TEST
GRADE 6
WICHITA PUBLIC SCHOOLS

CHOOSE THE ANSWER WHICH COMPLETES THE QUESTION.

1. Art museums are important for:

   A. collecting and sharing art and artifacts.
   B. selling expensive art.
   C. judging art work.
   D. hiding the best artwork for safety.

2. Art is important because:

   A. it conveys people's thoughts, ideas, feelings, and dreams.
   B. artists are often inventors and planners.
   C. our lives are touched by art in the designing of clothes, cars, homes, and products.
   D. all of the above are true.

3. A type of sculpture in which the figures are slightly raised off a flat surface is called:

   A. an artist's palette.
   B. a bas' relief.
   C. a style of building.
   D. Pop Art.

LOOK AT THIS PICTURE AND ANSWER QUESTIONS 4 AND 5.

4. Cultures of various lands have evolved their own forms of art. This picture is an example of art from:

   A. Egypt.
   B. South Africa.
   C. Greece.
   D. Peru.

5. The way the artists in this culture consistently drew their figures of people in profile is called an artistic:

   A. vision.
   B. choice.
   C. craft.
   D. style.

CHOOSE THE ANSWER WHICH COMPLETES THE QUESTION

6. Drawing the outside edge of an object with a single line is called a:

   A. viewpoint.
   B. crosshatching technique.
   C. contour drawing.
   D. relief drawing.

7. Colors placed on the color wheel directly across from each other are called:

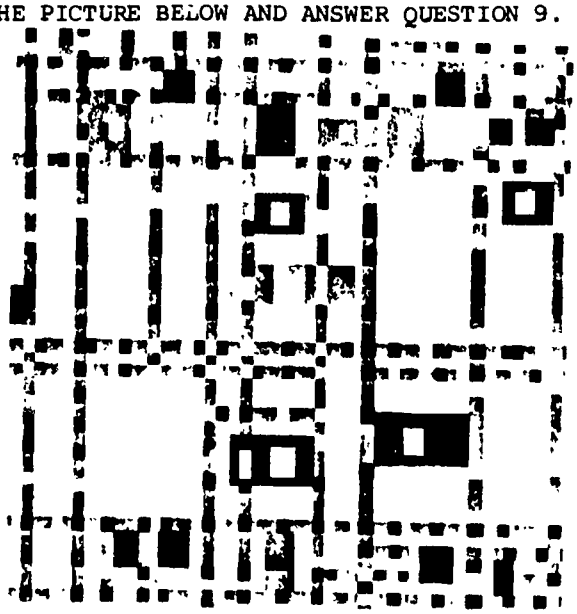
   A. secondary colors.
   B. complementary colors.
   C. analogous colors.
   D. intermediate colors.

LOOK AT THE PICTURE AND ANSWER QUESTION 8.

8. A mask such as this one is the same on both sides and has:

   A. very few circles.
   B. no patterns.
   C. no details.
   D. symmetrical balance.

LOOK AT THE PICTURE BELOW AND ANSWER QUESTION 9.



9. The main idea of this artwork is to paint:

   A. a story about a family.
   B. an exciting arrangement of colors and shapes.
   C. a commercial or design for TV.
   D. enough to fill the paper.

CHOOSE THE ANSWER WHICH COMPLETES THE QUESTION.

10. A collage is:
    A. a type of abstract sculpture.
    B. an architect's plan.
    C. an art work with 2 or 3-D objects glued onto a surface.
    D. a museum collection.

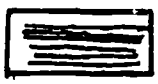
11. Showing distance or depth in a composition is called:
    A. perspective.
    B. shading.
    C. balance.
    D. variety.

12. In drawing a cube with one point perspective, all construction lines go to the:
    A. vanishing point.
    B. foreground.
    C. profile.
    D. top of the page.

13. A famous Renaissance artist who also displayed genius as an inventor and a scientist was:
    A. Rembrandt.
    B. Leonardo da Vinci.
    C. Picasso.
    D. Titian.

14. When creating distance or depth in a picture the artist will probably need to use:
    A. texture and shape.
    B. overlapping and smaller sizes in the background.
    C. patterns and color.
    D. lots of paint.

15. Texture may be both visual and tactile. The best visual texture of a prickly porcupine might be:

    A. 

    B. 

    C. 

    D. 

16. Three ways of handbuilding ceramics are to use methods of:

A. roll, punch and slam.
B. cut, paste, and sew.
C. pinch, coil, and slab.
D. slice, color, and form.

17. In looking at a work of art we should always try to:

A. understand the artist's message.
B. learn all we can about the artist.
C. gather a lot of information by looking at the art work.
D. do all of the above.

LOOK AT THE PICTURE AND ANSWER QUESTION 18.

18. We may evaluate (judge) works of art based on a variety of criteria (reasons). This picture might be judged "most successful" based on the artist's:

A. originality and new ideas.
B. good observation and drawing skills.
C. expressive use of colors.
D. lack of details.

CHOOSE THE ANSWER WHICH COMPLETES THE QUESTION.

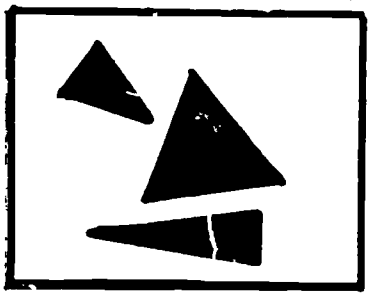
19. In looking at an artwork we may need to follow a model for art criticism. In such a model we will:

A. describe, analyze, interpret, and judge the art work.
B. paint and draw like the artist.
C. find out how much the art work cost.
D. look for places to hang the art work.

20. One method of producing a lot of ideas in a group or by yourself is called:

A. evaluating.
B. calculating.
C. brainstorming.
D. explaining.

LOOK AT THE PICTURE AND ANSWER QUESTION 21.



21. The positive shapes are the triangles and the other areas of the composition are called:

A. the middleground.
B. textured ground.
C. a negative space.
D. foreshortening.

CHOOSE THE ANSWER WHICH COMPLETES THE QUESTION.

22. Form follows function is a design principle considered most important in:

A. planning an architectural structure.
B. the early Colonial days, but no longer used.
C. communicating an artist's mood.
D. photographing flowers.

23. The relationship in size of one object or part of an object to another is called:

A. measurement.
B. mass.
C. value.
D. proportion.

24. Op artists are concerned with the:

A. use of color to produce an optical illusion.
B. use of optic lenses to create art.
C. way the optic nerve helps people talk.
D. optical illusions seen in the desert.

25. After the invention of the camera, there was no longer a need for extremely realistic painting, but a perception of the atmosphere was favored by:

A. Pop artists.
B. the Impressionists.
C. Renaissance artists.
D. Abstract painters.