

REPORT OF AN ATTEMPT TO JUDGE
THE RELATIVE MERITS OF SEQUENTIAL AND
NON-SEQUENTIAL LEARNING IN COLOUR

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ABSTRACT OF THESIS
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It was the purpose of this study to compare two teaching methods in art, one which emphasized a graduated, sequential approach and the other a non-sequential approach in an attempt to determine the effectiveness these two approaches have in developing an understanding of the content (colour) in the students and its applicability to art education. The results of a pre- and post-test were rated by judges and the results tabulated - no conclusive results were obtained as to the relative merits of the two approaches from an analysis of the data obtained. However, there was an indication that learning had taken place in both instances. Variables were noted with the study. A description of the content of the sequential class, the preparation of the pre- and post-tests for judging and the judging itself were discussed. Recommendations for further art education consideration were given.

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CHAPTER I

SIGNIFICANCE OF THE STUDY

The purpose of this study is to compare two teaching methods in art, one a graduated sequential approach (Group A) and the other a non-sequential approach (Group B) in an attempt to determine the effectiveness of these two approaches on the comprehension of the content (colour) by the students.

This study evolved from an attempt to formulate the "fundamental understanding of underlying principles"¹ that Bruner in his report of the Wood's Hole Conference of Education in 1960 refers to when he urges that "the curriculum of a subject should be determined by the most fundamental understanding that can be achieved of the underlying principles that give structure to that subject",² within the discipline of art.

Bruner considers learning to be one "massive general transfer"³ of knowledge. If art is to be taught within the school situation it is imperative that the effect of previous learning or subsequent learning be considered. Two kinds

1. Jerome S. Bruner, The Process of Education, Vintage Books, New York, 1960.
2. Ibid.
3. Ibid, P. 16.

of transfer are possible, positive and negative. Positive transfer occurs when something previously learned benefits performance or learning in a new situation. From the Bruce experiment and the Osgood transfer surface⁴ in the field of psychology we know that in order to have a strong positive transfer, similar stimuli and identical responses are necessary. While psychologists point out that virtually all learning in human beings involves transfer, educators are concerned with producing the greatest amount of positive transfer possible.

In a recent redefinition of cognitive structure, David Ausubel (1963) refers to the "stability, clarity, and organization of a learner's subject-matter knowledge in a given discipline".⁵ Learning or retaining information is then, in Ausubel's view, a matter of improving the organizational strength of the structure of the material to be learned. The order in which knowledge is taught, methods of presentation and arrangement of the knowledge all influence the cognitive structure. With this in mind, this study looked at two organizations or arrangements

4. Morgan, Clifford T., (ed.) Introduction to Psychology, McGraw-Hill Book Co., 1966, P. 131.
5. David P. Ausubel, The Psychology of Meaningful Verbal Learning, Grune and Stratton, 1963, P. 76.

of the same subject material to determine whether there would be any significant changes in the comprehension of the content material, depending upon the order in which the facets of that content were presented.

The availability of a written theory of colour by Johannes Itten⁶ provided a basis for the sequence of colour projects. In his book The Art of Colour, Itten points out that while the artist is interested in colour effects from their aesthetic aspect he needs both physiological and psychological information. "The discovery of relationships mediated by the eye and brain, between colour agents and colour effects in man, is a major concern of the artist", Itten explains, "Visual, mental and spiritual phenomena are multiply interrelated in the realm of colour and the colour arts".⁷

6. Johannes Itten, The Art of Colour, trans, Ernst Van Haagen, Reinhold Publishing Corporation, New York, 1961.

7. Ibid, P. 16.

I. CONTENT OF THE ART PROGRAM

The content of this art program is based on a rationale of the aesthetic colour theory of Johannes Itten. Originating as he tells us "in the experience and intuition of a painter",⁸ he approaches colour aesthetics from these three directions:

- Impression (visually)
- Expression (emotionally)
- Construction (symbolically)

The visually impressive component of coloration depends on a careful observation of the minutest modulations of colours in nature and painted as minutely on the canvas. The painters commonly referred to as Impressionists, such as Monet, Manet, Degas, Pissarro, Renoir and Sisley provide an example of artists who studied the local colours of objects, (haystacks, cathedrals) as modified by changing sunlight. As their work progressed, they became less involved with local colours and concerned themselves more and more with the colour vibrations produced by light on surfaces and in the atmosphere at different times of the day. Earlier artists attending to colour in this way were Velasquez and

8. Ibid, P. 15.

Van Eyck. The still-life of the low countries was another instance of this observation-biased exploration of colour.

For an emotionally expressive use of colour we can look throughout the history of art. In the work of Grunewald (1475 - 1528) colour was set against colour. The psychologically expressive power of his colours was used a century later by El Greco (1545 - 1614) in his strange abstract colour renditions matching the psychically expressive requirements of his theme. This internalized and spiritualized experience was explored again through colour by The Expressionist - Munch, Kirchner, Heckel, Nolde, and the Blaue Reiter painters Kandinsky, Marc, Macke, Klee. Kandinsky after 1908 contending that every colour has its proper expressional value.

Colour used for its symbolic value can best be viewed in mythological or religious works of the Romanesque and Early Gothic artists and in primitive cultures. There have been styles using colour to identify social strata or caste, or as symbolic terms for mythological or religious ideas. When a pre-Columbian painter in Mexico put a red-clad figure into his composition, it was understood to pertain to the earth god Xipe-totec and therefore to the eastern

sky, with its significance of sunrise, birth, youth and springtime. The figure was red, not from considerations of visual aesthetics or to convey emotional expression; its colour was symbolic to be read like a hieroglyph.

Itten points out that contrast effects and their classification are a proper starting point in the study of colour aesthetics. "Contrast", he tell us, "occurs when distinct differences can be perceived between two compared effects. When such differences attain their maximum degree, we speak of -- polar contrasts".⁹ Thus contrast of hue, cold-warm contrast and complementary contrast in their extremes are polar contrasts. The projects prepared for this study were developed by preparing two projects for each of Itten's three colour categories. The first having a greater polar contrast and the second a more subtle or low contrast. Since the expressive use of colour depends on a personal reaction to subjectively conditioned colour perception, and Itten found in his studies that the most satisfactory starting point in the study of colour was the personal reaction, it formed the first of the contrasts in the series. We know also from Lowenfield that, "the child's colour relationship during this period (age 9 - 11)

9. Johannes Itten, The Art of Colour, P. 35.

is related to his emotional reactions; it is highly subjective".¹⁰

Since the impression or visual component of colour depends on a careful observation of the minutest modulations of colour in nature as noted at the beginning of this chapter, it was considered difficult and therefore placed as the last of the three categories.

II.. PRE-TEST AND POST-TEST

At the first and last meeting of the groups the students were together as one class and were given painting assignments which were used as a pre-test and a post-test respectively. The works from these two classes, formed the body of work which was used to evaluate the program. Three judges rated the finished products, and on the basis of their decisions an analysis of the program was made. Three additional judges were asked to rate the work when the first ratings proved inconclusive, giving a total of six ratings in all.

10. Victor Lowenfeld, Creative and Mental Growth, MacMillan and Co., New York, 1957, P. 192.

TABLE I

SEQUENCE OF PROJECTS

QUALITY OF COLOUR	CONTRAST	PROJECT
Expression	Greatest	4 Seasons - Contrast of Hue
	Low	Monochromatic Space
Construction	Greatest	Cold - Warm Contrast
	Low	Tone
Impression	Greatest	Complementary - Contrast
	Low	Secondary

III.. LIMITATIONS

It became apparent during the course of the ten week period selected for the study that the length of time and the size of the group were deterrents to a valid outcome. The ten week period could have been too short a period in which to have a definite change occur. However the length of time was pre-determined by the art laboratory's schedule. Also it was impossible to control the external conditions of the children which might affect the results of the work done. Children came to the classes with varying artistic knowledge and experience gained from varying sources. Some brought considerable art experience with them to the classes, parents who were professional artists, many years of attending art classes and all possible encouragement and opportunity within their home life to practice, while others came to the class without any background in art whatsoever. Also the sample was small. A greater number would provide more valid results. The subjectivity of judging is an area which merits comprehensive research outside of the area of this study.

CHAPTER II

RELATED LITERATURE

Art education writings have with continuing frequency been establishing more scientifically based facts about creativity, artistic learning and social forces affecting art. The field has developed toward an intellectual maturity within which every art educator is testing existing ideas and generating new ones. More and more theories are being tested for validity.

I. BACKGROUND STUDIES

A plea for adequately structured research in art education to provide a clear definition of subject matter for methodological investigations was put forth by the recent government-supported Seminar in Art Education for Research and Curriculum Development at the Pennsylvania State University in 1966.

A paper presented to the Seminar by Nathaniel Chaplin pointed out that "the problem for the human sciences and for educational research is to formulate a comprehensive and systematic theory of the subject matter for inquiry in logical connection with which:

- a. attributes can be distinguished from necessary and sufficient conditions and,

- b. necessary and sufficient conditions can be explicitly determined.¹¹

Douglas and Schwartz in a recent study involving guided experiences found a marked difference in the quality of comprehension of art ideas between children whose art experience was structured and those whose experience was left to chance. The second group, furthermore, "missed the opportunity to build foundations upon which subsequent art value judgements may be built".¹²

II. AGE GROUP USED

This particular group, from ten to twelve years of age, was selected because of their ability to combine and unite information. It was necessary to have students who were in a stage of their intellectual development where they had the ability to group objects and events on the basis of several concrete observations. Where experience with the selected element of colour in varying forms could,

11. A Seminar in Art Education for Research and Curriculum Development, Co-operative Research Project V-002, The Pennsylvania State University, Pennsylvania, 1966, P. 310.
12. Studies in Art Education. A Journal of Issues and Research in Art Education, Vol. 10, No. 2, Washington, D. C. National Art Education Association, Winter, 1969.

if the inclination was there, culminate in a greater comprehension of that element.

We know from Piaget that "the role of experience increases in importance (as the age progresses). During the fifth stage, the utilization of experience spreads still more, since this period is characterized by the experiment in order to see and the coordination of schematic extends henceforth into discoveries of new means through active experimentation".¹³

The fourth stage, ages seven to eleven, is that of concrete operations; and the fifth stage beginning at approximately age 11, the age of formal operations.

13. Jean Piaget, The Origins of Intelligence in Children, trans. Margaret Cook, W. W. Norton and Company Inc., N. Y. 1952, P. 361.

CHAPTER III

PROCEDURES OF THE STUDY

I. DESIGN OF THE STUDY

A group of ten to twelve year olds was selected from the existing art education classes of the Art Education Laboratory of Sir George Williams University. This group was divided into two smaller groups, A and B, by pairing for age, sex and working approach. This working approach was based on the two levels of thinking defined by Guilford (1959) as being divergent operations or convergent operations. "In the divergent operation, the learner thinks in different directions, searching and seeking out a solution. In the convergent operation the information leads to the conventional answer with little room for exploration".¹⁴

The study was conducted during the normal fall term and was integrated into the regular art program. One fall term consisted of ten weeks, the length of time of the study.

14. National Art Education Association, Studies in Art Education. Volume 8, No. 2, Spring 1967, P. 8.

Both Group A to be the structured group and Group B to be the non-structured group were to be taught by graduate students in the Masters of Art-Education Program of Sir George Williams University.

Treatment of the Group

Group A was exposed to a graduated sequential arrangement of the element of colour according to Itten's theory of preferences. Group B was exposed to the same elements of colour but presented in a random order. At the first and last meeting of the group a pre- and post-test was given in the form of a painting assignment.

II. SELECTION AND DESCRIPTION OF STUDENTS

The population from which the group of students was selected to take part in this study was the Art Education Laboratory of Sir George Williams University. Their common characteristic being their enrollment as art students in this urban university. Eleven students had enrolled for the ten to twelve year old class. Of the eleven, two were ten, seven were eleven, and two were twelve years old. There were nine girls and two boys. These classes were held weekly on Saturday mornings throughout the university year as

experimental centers in the field of art education. Students consisted of faculty family and other interested members of the non-academic community.

Many of the enrolled had had considerable experience in previously attended art classes so the level of art knowledge was quite high. Their home environment proved to be quite artistically stimulating with either parent being active in the arts as teacher or performer. Only two came from family situations which were not artistically inclined. The students were composed of a middle to upper-middle socio-economic class.

III. LENGTH OF TIME OF STUDY

This study was undertaken during the regular meetings of the Art Education Laboratory classes. Ten classes were scheduled in the fall term. Each class had a duration of two hours, therefore twenty class hours were put in by the students.

IV. SELECTION AND DESCRIPTION OF TEACHERS

The teachers for the two groups were of sufficient similarity so as to allow no great variance in classroom

manner and affect the outcome of the study. Both were master's candidates in an art education program, graduate students with a similarity of background experience. The author of this study taught Group A throughout and another graduate student taught Group B. Both teachers participated in the pre- and post-tests when the two groups were together as one. The similarity of classroom behaviour, language, relationship with students was notable. Also the physical appearance was of sufficient similarity to cause comment from the students.

V. SELECTION AND DESCRIPTION OF ART JUDGES

Students from the graduate program in Art Education were selected to rate the art products. These judges had gained their art experience from various institutions. All had considerable teaching experience in school systems and special art classes. They were chosen for their similarity of backgrounds and experience with children. All had acted as judges previously.

VI. ADMINISTRATION AND DESCRIPTION OF PRE- AND POST-TEST

The pre- and post-tests were carried out at the first and last meeting of the class with all students present. Both

instructors participated in the administration and discussion of the projects.

The Pre-Test

The pre-test consisted of a painting assignment designed to allow any or all three qualities of colour (Impression, Expression and Construction or Symbolic) to be present in their work. This test was carried out at the first meeting of the class before the students were divided into two groups. No mention was made at this time of colour other than that pertaining to the particular project.

General Objectives. The project of interpreting the four seasons of the year was designed to explore the quality of colour used subjectively by the students. Also to see how the changing seasons could be interpreted through colour, and to determine if in fact the students were sensitive to the changes and if so, were they able to translate these changes into paint.

Specific Objectives. The class was asked to do four paintings, one for each of the four seasons of the year. Attention was to be given to the distinctive colours, feelings, sights, of the varying times of the year.

Motivation. The class began with a general discussion of the characteristics of the Canadian Autumn or Fall, that being the season at the time of the class. They then went on to discuss the other three seasons and the various responses which they illicited.

Materials. The paintings were done on 24" x 36" bond paper with liquid tempracolour using #12 hog hair brushes. Some larger brushes were available. The three primary hues plus black and white provided a full selection for the possibility of any colour combination. All materials were arranged by the students prior to the discussion so that they could proceed to paint as soon as they understood the problem and developed ideas which they wanted to carry out.

Observations and Evaluation. The students verbal description of the four seasons were fairly consistent. Some difficulty was encountered in the attempt at interpretation through paint. While it was suggested and encouraged that the quality of the season could be conveyed by the use of colour and brushwork in a free abstract manner, the tendency within the class was to develop figurative paintings in which the season was represented by an

appropriate building or tree; pine tree - Fall, seascape
- Summer.

The Post-Test

In the post-test, four facial moods or expressions were replaced by the four seasons as subject matter. The test was similarly administered by the two instructors each sharing teaching duties. Both Group A and Group B, which had been divided after the pre-test, met together as one class. All work produced was kept for rating.

VII. CONTENT OF THE SEQUENTIAL GROUP A AND NON-SEQUENTIAL GROUP B

Content of the classes was developed by arranging the three categories of colour in their most easily comprehensible order for this age of concrete operations and formal operations. It was felt from knowledge gained in previous teaching experience with this age group that the expressive quality would be the most appealing and comprehensible to students. Then Constructive use and thirdly the Impression or Visual. Within each of the three categories, two projects were planned. One of a fairly direct nature, presenting the problem with the greatest contrast or

clarity possible. The second project was a more subtle nature or low contrast. Thus a series of six projects was built up to follow one another to form the sequential arrangement.

LESSON PLAN NO. 2

EXPRESSION -- LOW CONTRAST -- MONOCROMATIC SPACE

General Objectives

To have the students become more aware of the endless variations within one hue and the possibility of using limited colour to achieve full expression in a painting.

Specific Objectives

To do a painting of outer space, beyond the earth's atmosphere. Also to gain experience in the physical mixing and application of paint, the variety of brushstroke, and the possible viscosity of paint.

Motivation

When all had arranged their materials, the class gathered together to discuss the American astronauts moving through space and circling the moon which had taken place the day before the class. Most of the children had watched it on television. The discussion centered around the quality of space. What colour was it? Was there any movement? What did it look like? All knowledge that the children had gained from photographs, books, or films was shared amongst the group. When all existing knowledge was

exhausted, the children closed their eyes and tried to imagine what space would look like if they were hurled through it. The possibility of mixing an infinite number of variations using only one hue and black and white was demonstrated and then the students began to work.

Materials

- . 24" x 36" bond paper
- . #12 hog hair brushes
- . liquid temperacolor (one colour plus black and white per student)

Evaluation

Attention was focused on the making of new chromas. Attention is the focusing on certain aspects of current experience and neglecting others. Attention has a focus in which events are clearly perceived and a margin in which they are less clearly perceived. Chromas are the mixtures of the pure unclouded colours with each other. Attention was high during the actual mixing of the chromas. An air of discovery pervaded the classroom. However, attention was less high later during the use or application of the colours to the paper.

LESSON PLAN NO. 3

CONSTRUCTION - GREATEST CONTRAST -- COLD-WARM CONTRAST

General Objectives

To create different colour effects, symbolic of various feelings or places.

Specific Objectives

To combine warm and cool colours using transparent film in the manner of stained glass. To develop manual dexterity in the construction of the forms. To become aware of the warm-cold contrast.

Motivation

Students discussed examples of transparencies. Many had seen stained-glass windows or pieces of sculpture incorporating transparencies. Pieces of thin transparent primary colours were viewed by the students against window and/or artificial light.

Materials

- . sheets of transparent (red, yellow, blue) paper

- . scissors and mat knife
- . white all-purpose glue
- . $\frac{1}{4}$ " strips of balsa wood

Evaluation

There was a variety of individual treatment within the group. Some two dimensional pieces were made resembling stained glass windows. The majority preferred to build three dimensional forms - a cube, a pyramid, or free form on which to glue their coloured papers. Most grasped the idea immediately and set to work with enthusiasm. Two weeks were needed for this project, one for building the forms and one for adding the coloured paper. Pieces were held up to window light or illuminated from within by light bulbs. A very successful class in terms of student involvement and comprehension.

LESSON PLAN NO. 4

CONSTRUCTION - LOW CONTRAST - TONE

General Objectives

To become aware of and produce variations in the tonal value of colours through light.

Specific Objectives

To make lanterns to hang with a light source inside.

Motivation

A discussion of lanterns led to a discussion of the effect of blocking off a light source. The quality of lightness and darkness were experienced by holding sheets of tissue paper up to a light, between the eyes and the light source.

Materials

- . balloons
- . tissue paper
- . wallpaper paste
- . light bulbs

Evaluation

A very direct way of experiencing the tonal quality of a colour. The lightness and darkness by being produced through physical overlapping gave a very clear control over the tonal development. Students could gradually develop the tones, adding or subtracting paper thus working in a very flexible manner.

LESSON PLAN NO. 5

IMPRESSION - GREATEST CONTRAST - COMPLIMENTARY COLOURS

General Objectives

To have students discover the relation of complimentary colours, their existence and effect created by their juxtaposition.

Specific Objectives

To design a record cover for electronic music exhibiting some of its vibrating qualities.

Motivation

An experiment was carried out by the students to discover the relationship existing between complementary colours. Students were asked to observe a painted dab of colour on a white sheet of paper, then quickly shift their eyes to a white sheet of paper and wait for the 'after' image to appear. Thus the complementary colours were 'discovered' by the students.

A selection of electronic music by Ilhan Mimaroglus was played, Visual Study No. E after Jean Dubuffet, Bowery

Bum. This was followed by a discussion on electronic music, its variations, and production.

Materials

- . acrylic paints
- . masking tape
- . gesso
- . brushes and roller
- . masonite

Evaluation

This method of self-identification gives the student an independence from the teacher in determining the colours he uses. He can check on its accuracy as many times as he wishes to verify his own work. It is not his word against the teacher's but an optical fact. He is creating as it were, a phenomena from visual evidence which he gathers personally.

LESSON PLAN NO. 6

IMPRESSION - LOW CONTRAST - FILM SECONDARY COLOUR

General Objectives

To acquaint the student with the constantly changing, flowing nature of colour as one hue merges with another to produce a third or "secondary colour".. Secondary colour is the new hue produced by mixing in equal proportions any of two primary colours, red, yellow or blue. To have the student responsible for the mixing of his own colour.

Specific Objectives

To produce a 16mm hand painted film to illustrate the development of the secondary colours (orange, green and purple) from the primaries (red, yellow and blue).

Motivation

The class was shown three of Norman McLaren's hand painted films. They then examined the actual film to see how a shape was repeated in each frame. The technical production of film was discussed, covering such information as the number of frames per second, how to make a shape move across the screen, and viewing time when projected.

Materials

- . 16mm clear leader film
- . transparent inks, red, yellow, blue
- . small brushes
- . felt nib and nylon nib pens
- . 16mm film projector
- . splicer and tapes or cement

Evaluation

Students became very involved with the process, asking questions and delving into the film making aspect. Group A manipulated the merging colours in long sequences indicating their comprehension of the film timing. Group B tended to draw single figures and disregard the results of their image. A direct and stimulating project.

CONTENT OF NON-SEQUENTIAL GROUP B

Students in Group B were exposed to similar facets of the selected element of colour as Group A. However, the actual project given varied. For example: In Group A the project to explain the transparency of colours involved the covering of three dimensional forms with transparent sheets and producing colours by overlapping. In Group B the sheets were projected by means of an overhead projector on to a screen where the mixing of colours took place. There was no attempt to relate one week's project to the next, except in instances of a project requiring two weeks to complete. No attempt was made to develop the previous week's work. Each class was self-contained. Care was taken, however, to give exposure to the same properties of colour as Group A experienced.

CHAPTER IV

ART JUDGING PROCEDURES

Since the entire study was based on the qualities of colour as identified by Itten, the rating of the work was for these same three qualities; Impression, Expression and Construction. See page 3 for definition.

Preparation of Material

All work produced by the students during the pre- and post-tests were kept for rating by the judges. To prepare the pieces a coding system was devised to identify each piece and facilitate tabulation. Students names were arranged alphabetically and assigned a letter of the alphabet. The group distinguishing letters were assigned to each child according to the group he was in, A or B. Thus, the students from Group A were coded A-A, A-B, A-C, A-D, A-E, A-F, and the students from Group B became B-G, B-H, B-I, B-J, B-K. This information was placed in the upper left hand corner of the back of each piece of work. Space was also provided for the ratings of each judge.

10 - Point Evaluation Scale

A 10 point evaluation scale was used by the judges. This provided a sufficiently wide range for the rating. The

lowest score was to be 1 which would indicate a complete lack of the judged quality. 10 would indicate comparatively the highest degree of that quality. Each quality was to be judged separately - it being quite possible for a painting to rate high for two of the qualities or all of them. Similarly a piece might be low in all three.

Description of Judging

It should be noted here that in the initial stages of this study, only three judges were selected. Three being initially considered a sufficient number to provide a meaningful result without unnecessary repetition. However, the correlation of their ratings showed no reliability. It was therefore decided, in an attempt to establish some reliability between the judges, that three more judges would rate the work. Thus, the number of judges doubled to six.

It was decided by the judges that an overall view of the work would facilitate rating. A range of the capabilities of the group could be seen at a glance and the rating scale applied. The work from both Group A and Group B done in the pre-test was displayed. Each judge then

proceeded to rate every piece of work according to the agreed upon definitions of the three qualities of Impression, Expression, and Construction. The post-test was similarly judged.

A thorough discussion as to the meaning of the three qualities of colour was held at the onset of the meeting of the judges to insure agreement as to their meaning. Every judge expressed difficulty distinguishing between Impression (visual) and Construction (symbolic). It was pointed out that in the facial expressions- red lips, for example, could be either Impression because of direct observation or Symbolic because of an attempt to show a type of person. Black and white were included as colours.

Care was taken to distinguish between use of colour and the use of line or drawing. In some cases, particularly the facial expressions of the post-test, the judges expressed difficulty in distinguishing whether the quality of the work was due to line or colour.

It was noted that some of the post-test paintings had words pertaining to emotion written on them. It was thought that these were an expression of the intent of the student

and therefore should be considered as the facial expression depicted.

The results of the judging are tabulated in Tables II, III, IV, V, which follow.

The ratings for each quality can be seen by reading across the Tables from left to right. It should also be noted that because of the various number of paintings completed by each student, the number of ratings varies from pre-test to post-test. Student A - A, for example, completed five paintings in the pre-test but only one in the post-test. Therefore, there are ratings for five A - A's under the student column in Table II, and Table IV, but only one A - A under the student column in Table III and Table IV.

TABLE II

RATINGS FOR WORK PRODUCED IN PRE-TEST BY GROUP A

STUDENT		JUDGE 1	JUDGE 2	JUDGE 3	JUDGE 4	JUDGE 5	JUDGE 6	TOTAL
A - A	IMPRESSION	3	8	6	4	5	6	32
	EXPRESSION	5	8	4	10	9	8	44
	CONSTRUCTION	7	8	4	1	7	2	29
A - A	IMPRESSION	7	7	8	1	1	7	31
	EXPRESSION	6	7	4	10	10	8	45
	CONSTRUCTION	3	8	5	2	6	8	32
A - A	IMPRESSION	6	6	6	2	4	7	31
	EXPRESSION	5	7	4	9	7	7	39
	CONSTRUCTION	6	4	7	2	7	7	33
A - A	IMPRESSION	7	6	7	4	2	9	35
	EXPRESSION	5	10	6	9	9	8	47
	CONSTRUCTION	5	8	4	2	2	4	25
A - A	IMPRESSION	4	7	6	1	2	2	22
	EXPRESSION	4	8	1	7	2	6	28
	CONSTRUCTION	2	10	1	1	4	2	20
		75	110	73	65	77	91	

TABLE II (Continued)

STUDENT		JUDGE 1	JUDGE 2	JUDGE 3	JUDGE 4	JUDGE 5	JUDGE 6	TOTAL
A - B	IMPRESSION	2	7	1	1	1	1	13
	EXPRESSION	4	10	3	10	8	10	45
	CONSTRUCTION	2	10	3	1	1	5	22
A - B	IMPRESSION	5	8	7	3	2	7	32
	EXPRESSION	3	8	8	6	5	5	35
	CONSTRUCTION	1	9	1	2	1	4	18
A - C	IMPRESSION	7	9	8	3	4	4	35
	EXPRESSION	7	7	4	9	8	9	44
	CONSTRUCTION	6	7	3	3	10	3	32
A - C	IMPRESSION	8	8	7	8	5	6	42
	EXPRESSION	4	8	5	3	9	5	34
	CONSTRUCTION	3	8	4	1	5	5	26
A - C	IMPRESSION	4	7	6	1	1	1	20
	EXPRESSION	4	5	3	7	10	10	39
	CONSTRUCTION	5	7	6	1	5	1	25
A - D	IMPRESSION	7	7	6	3	1	7	31
	EXPRESSION	7	6	3	7	8	8	39
	CONSTRUCTION	7	6	8	1	8	2	32
		86	137	86	70	93	93	

TABLE III

RATINGS FOR WORK PRODUCED IN PRE-TEST BY GROUP B

STUDENT		JUDGE 1	JUDGE 2	JUDGE 3	JUDGE 4	JUDGE 5	JUDGE 6	TOTAL
B - F	IMPRESSION	4	7	3	1	1	10	26
	EXPRESSION	7	7	1	9	8	5	37
	CONSTRUCTION	2	8	2	10	2	8	32
B - G	IMPRESSION	9	6	8	8	1	5	37
	EXPRESSION	8	4	4	4	4	8	32
	CONSTRUCTION	6	1	9	2	6	5	29
B - H	IMPRESSION	9	5	8	7	8	8	45
	EXPRESSION	8	4	4	4	1	1	22
	CONSTRUCTION	6	1	9	1	1	4	22
B - J	IMPRESSION	8	6	7	10	3	7	41
	EXPRESSION	7	5	3	3	1	3	22
	CONSTRUCTION	3	3	8	1	8	5	28
B - K	IMPRESSION	7	5	8	3	1	10	34
	EXPRESSION	7	7	3	5	5	2	29
	CONSTRUCTION	3	8	3	3	5	2	24
		94	77	80	71	55	83	

TABLE IV
RATINGS FOR WOK PRODUCED IN POST-TEST BY GROUP A

STUDENT		JUDGE 1	JUDGE 2	JUDGE 3	JUDGE 4	JUDGE 5	JUDGE 6	TOTAL
A - A	IMPRESSION	5	3	6	5	10	8	37
	EXPRESSION	4	10	5	6	5	2	32
	CONSTRUCTION	1	5	8	1	1	1	17
A - B	IMPRESSION	1	2	2	1	1	1	8
	EXPRESSION	3	8	8	10	10	8	47
	CONSTRUCTION	3	9	2	1	10	10	35
A - B	IMPRESSION	1	7	6	2	2	1	19
	EXPRESSION	3	10	10	10	2	10	45
	CONSTRUCTION	3	9	1	3	2	5	23
A - C	IMPRESSION	2	8	9	2	8	2	31
	EXPRESSION	4	8	5	9	9	10	45
	CONSTRUCTION	3	8	2	1	9	7	30
A - E	IMPRESSION	7	9	8	5	10	7	46
	EXPRESSION	8	8	5	7	10	7	45
	CONSTRUCTION	8	10	6	1	10	1	36
A - E	IMPRESSION	1	1	1	1	1	2	7
	EXPRESSION	1	1	1	4	1	3	11
	CONSTRUCTION	2	3	1	1	1	1	9
A - E	IMPRESSION	2	9	4	2	1	5	23
	EXPRESSION	3	10	10	8	9	8	48
	CONSTRUCTION	4	10	1	1	9	1	26
		69	168	101	81	121	100	

TABLE V

RATINGS FOR WORK PRODUCED IN POST-TEST BY GROUP B

STUDENT		JUDGE 1	JUDGE 2	JUDGE 3	JUDGE 4	JUDGE 5	JUDGE 6	TOTAL
B - F	IMPRESSION	8	7	3	7	9	9	43
	EXPRESSION	5	7	3	4	9	8	36
	CONSTRUCTION	6	4	8	3	9	3	33
B - F	IMPRESSION	1	3	3	2	1	4	14
	EXPRESSION	6	10	9	9	9	8	50
	CONSTRUCTION	5	8	2	1	9	6	31
B - G	IMPRESSION	2	9	7	1	1	2	22
	EXPRESSION	7	8	7	7	2	8	39
	CONSTRUCTION	4	9	1	1	1	7	23
B - H	IMPRESSION	2	3	3	2	10	4	24
	EXPRESSION	8	7	5	8	1	5	34
	CONSTRUCTION	2	1	8	4	1	3	19
B - H	IMPRESSION	2	5	7	2	4	5	25
	EXPRESSION	3	8	4	8	10	7	40
	CONSTRUCTION	3	8	7	4	8	6	36
B - H	IMPRESSION	9	8	8	8	9	9	51
	EXPRESSION	6	10	5	10	10	7	48
	CONSTRUCTION	4	8	6	3	10	4	35
		83	123	96	84	113	105	

TABLE V (Continued)

STUDENT		JUDGE 1	JUDGE 2	JUDGE 3	JUDGE 4	JUDGE 5	JUDGE 6	TOTAL
B - H	IMPRESSION	8	8	7	2	10	7	42
	EXPRESSION	8	5	4	8	10	7	42
	CONSTRUCTION	2	8	3	4	1	5	23
B - I	IMPRESSION	4	2	2	2	1	8	19
	EXPRESSION	3	8	7	5	4	7	34
	CONSTRUCTION	4	6	7	2	1	5	25
B - I	IMPRESSION	6	2	4	1	4	10	27
	EXPRESSION	5	7	5	4	2	2	25
	CONSTRUCTION	1	8	6	1	1	7	24
B - I	IMPRESSION	4	6	3	1	1	4	19
	EXPRESSION	5	7	5	6	10	6	39
	CONSTRUCTION	2	8	3	2	1	2	18
B - I	IMPRESSION	6	2	4	2	1	10	25
	EXPRESSION	4	7	5	4	10	4	34
	CONSTRUCTION	3	1	8	1	10	3	26
		65	83	73	45	67	87	

CHAPTER V

RESULTS OF THE ANALYSIS OF SCORES

It was noted that in very few instances was there any agreement on the rating among the judges. In only fourteen out of the one hundred and one ratings was there an agreement among the judges - six ratings where four agreed and one rating where five agreed. In no case did the six judges assign the same rating. Since it was evident from the diversity of ratings that no reliability between the judges could be established, no firm conclusions can be made on this date, however, the problem of judging itself became acute.

The criteria for judging, the scales used, the training required have all begun to be studied by researchers. (See Studies in Art Education) - a recent study by Lewis and Mussen indicated this trend and underlines the necessity of more research in this area.¹⁵

15. Hilda P. Lewis, Paul H. Mussen, Studies in Art Education, a journal of issues and research in art education, Vol. 10, No. 3. National Art Education Association, Washington, 1969, P. 25.

Differences Between Pre- and Post-Tests

There were a number of observable differences between the paintings of the pre-test and those completed ten weeks later in the post-test. A decided sureness had developed in the handling of the paint over the period of time. There were on the whole less paintings produced per student in the later class than the first class indicating that the students had developed an ability to carry through a piece of work to a more complete state, an ability not shown in the rating scale, but one which would reflect upon the effect of a concentrated depth approach to teaching.

A comparison of the number of times that the highest rating of 10 appeared in both test was made.

TABLE VI

COMPARISON OF THE NUMBER OF TIMES A RATING OF 10 APPEARED IN THE PRE- AND POST-TEST

GROUP	TEST	NO. OF TIMES 10 OCCURRED
A	PRE	12
A	POST	18
B	PRE	4
B	POST	14

Since both Group A and Group B had a greater number of high scores in the post-test than appeared in the pre-test this would seem to indicate only that some comprehension or learning had indeed taken place. Learning is used here as a general term, referring to a relatively permanent change in behaviour that is the result of past experience or practice. Since this is expected or at least hoped for in any learning situation, the increase in number of high ratings indicated only that the planned series of colour experiences for the students did, in fact, produce an increase in their knowledge, but much lower % of increase in Group A than in Group B.

Description of Variables

While every effort had been made to select instructors matched as to ability, age and experience, still the fact remained that two different individuals were inter-reacting with the students. The teacher variable was then a very real one. As previously stated, the actual projects varied in some cases from one group to another. This could certainly have affected the outcome of the Study.

Outside environment, both home and school, could have exerted considerable influence on the knowledge and attitude

of the student. The background knowledge of this group of students would include value judgements and varying approaches to art that could affect their working in class. Higher scores could be attributed to a greater range of experience accumulated and to a difference in motivation.

CHAPTER VI

SUMMARY AND CONCLUSION

The primary motivation for the present study developed from a growing concern in art education for greater dialogue between the concerns of the professional practising artist and the art experiences of art students. Several questions came to mind. What are the elements that concern the professional artist? How can these be taught? How best can the art-educator provide experience in these areas for his students? To recapitulate, the view presented at the beginning of this study advocates "that the curriculum of a subject should be determined by the most fundamental understanding that can be achieved of the underlying principles that give structure to that subject".¹⁶

Art education has been guilty of "teaching specific topics or skills without making clear their context in the broader fundamental structure of a field of knowledge".¹⁷ Bruner warns that "knowledge one has acquired without sufficient structure to tie it together is knowledge that is likely to be forgotten".¹⁸

16. Jerome S. Bruner, The Process of Education, Vintage Books, Harvard University Press, New York, 1960, P. 31.

16. Ibid, P. 31.

17. Ibid, P. 31.

The analysis of scores obtained in this study seems to indicate no conclusive evidence to support the first hypothesis made that the order of the presentation of the facets of the selected element of colour would affect the comprehension of that element. However, the limitations of time, number of students, and instructor variable may have been prohibitive to more conclusive results. It would indicate the need for much further research concerning the series or inter-relationships of a series of classes.

Recommendations for Further Consideration

The findings of this study indicate some significant directions for further research. The sequential arrangement of other art elements should be thoroughly tested over an extended period of time. In relation to this and having priority to it should be the designation as to what in the arts constitutes the basic art elements in Bruner's terms of reference. Considerable controlled research is needed in this designation of elements as well as their arrangement in serial or sequential order.

Since learning was shown to have taken place, the "well-prepared mind"¹⁸ which Bruner maintains is necessary for

18. Jerome S. Bruner, On Knowing, Harvard University Press, Cambridge, Mass., 1963, P. 82.

learning, must have been developed. A look at the post-tests shows that both Group A and Group B were assigned a greater number of 10's, the highest numerical rating, than they were in the pre-tests. The depth approach employed in this Study did in fact develop concepts, which according to Bruner are necessary "in order to make sense of the operations they have performed".¹⁹

The difficulty encountered in the area of judging itself, points up the necessity of greater researched information in the area of evaluation of art products. Since the judges' views depended on individual background training; this would account for the variance in the rating of each of the criteria. This dependence on the individual accumulated opinion must be eliminated if a valid evaluation system is to be developed. Some of the judges expressed uncertainty during the rating about the exact meaning of the three categories to be judged. Although there was some evidence of agreement among the judges, it was sparse and insufficient. It was decided, however, to accept the ratings of the six judges because of their experience in teaching and grading of childrens art work and qualifications as art-education post-graduate students.

19. Ibid, P. 102.

Additional studies need to be undertaken in the areas outlined here in order to substantiate art as an integral part of the educational system and clarify the problems facing art programs today.

BIBLIOGRAPHY

- AUSUBEL, David P., The Psychology of Meaningful Verbal Learning, Grune and Stratton, 1963.
- BRUNER, Jerome S., On Knowing - Essays for the Left Hand, Harvard University Press, Cambridge, Mass., 1963.
- BRUNER, Jerome S., The Process of Education, Vintage Books, Random House, Inc., New York, 1960.
- EISNER, Elliot W., ECKER, David W., (ed) Readings in Art Education, Blaisdell Publishing Co., 1966.
- ITTEN, Johannes, The Art of Colour, Trans.. Ernst van Haagen, Reinhold Publishing Corporation, New York, 1961.
- LOWENFELD, Victor, Creative and Mental Growth, MacMillan Co., New York, 1957.
- MATTIL, Edward (ed.) A Seminar in Art Education for Research and Curriculum Development, Cooperative Research Project V-002, The Pennsylvania State University, University Park, Pennsylvania, 1966.

MORGAN, Clifford T. and KING, Richard A. (ed.) Introduction to Psychology, McGraw-Hill Book Company, 1966.

National Art Education Association, Studies in Art Education, Vol. 8, No. 2; Vol. 10, No. 3; Washington, D. C.

PIAGET, Jean, The Origins of Intelligence in Children, Trans.. Margaret Cook. W. W. Norton and Co., Inc., New York, 1963.