Effects of Teaching Perspective in a Structured and Systematic Way on Still Life Drawing of Elementary Students: An Empirical Study

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The purpose of this study was to determine if the sequential method of teaching art skills (Brookes, 1986) could improve the success of intermediate grade school art students. Students were required to draw pictures of still life. A between groups pre-posttest crossover design was used to compare and evaluate the quality of perspective drawings before and after training. The results indicated significant improvement in the drawing skills of elementary students after they had been taught with the sequential method of teaching perspective. When the control group was later instructed in the sequential method of teaching, their scores also significantly improved. The applicability of the outcomes and the importance of measuring the clinical significance in art instruction were discussed.

The value placed on art education and the way it is taught in the school curriculum is receiving much attention in education today. Because of the emphasis on student learning objectives in today's educational system, art instruction also is being examined and is receiving criticism from both within and outside of education. Some art educators complain that teaching structured elementary art techniques stifle expressiveness and imagination. Others feel teaching young children step by step visual art techniques not only improves art skills but enhances creativity and improves basic academic subjects as well (Brookes, 1986).

The American public has long displayed an ambivalence toward the arts. The place of visual arts in American society, to most Americans, is viewed a post-occupation to be dabbled in where there is nothing better to do (Beeching, 1987). Although the arts proliferate in our society, very few people recognize the area of the visual arts for what it is; a non-verbal craft of communication which can be learned (Beeching, 1987). The lack of an intellectual framework for art makes it difficult for teachers and administrators to explain the subject and its importance (Willats, 1983). Radical changes in the way our culture conceives both art and education are needed in order for art education to be of importance in our school curriculum (Gross, 1983).

Compared with other disciplines, there is a small empirical research tradition in the visual arts. There is very little critical and analytical basis known for the subject. To create the conditions for quality education in art, our schools need to require a radical restructuring of our educational priorities and methods (Gross, 1983).

Most elementary teachers feel uneasy teaching the visual arts because of a lack of confidence in the subject themselves (Ahmad, 1986). This typically leads to art being taught through an assembly line production of craft projects. Children show little enthusiasm because they cannot create independently.

The basic skill of drawing is the one common denominator that unites the visual arts. Drawing is to visual art as penmanship is to writing, as mathematics is to physics, and as scores are to music. Drawing skills should not be approached on the basis that they are acquired through osmosis, rather than through diligent and repetitive practice. This discipline contributes to the education of a visual artist, and the ability to bring the intangible images of perception into the concrete realm of reality (Beeching, 1987).

The art of drawing is improved when a person learns "seeing" skills. It is simply a matter of learning basic perceptual skills, the special ways of seeing required for drawing. Anyone can learn enough "seeing skills" to draw a good likeness of something seen "out there" in the real world (Edwards, 1986). This way of seeing and belief that direct perception is an integral part of thinking is a creative process. When integrated with the verbal, analytical thought learning visual perception techniques provide the ingredients essential for true creativity. The global, visual, perceptual mode of the human brain is being accepted as equal in value to the sequential, verbal, analytic mode in the thinking process (Edwards, 1986).

The classic psychological literature on perception has noted that learning to see what is in one's environment is both an innate as well as learned process. From the literature on depth perception, Walk and Gibson, (1961) found that most infants will avoid a visual cliff as soon as they can crawl. These outcomes have been widely replicated across a wide variety of participants (Walk & Gibson, 1969; Walk, 1968). The question that emerges from this literature revolves around the issue of why is it necessary to learn to see what is already out there? It is our view that this can be sequentially trained.

Visual, perceptual skills appear to be enhanced through training, just as the verbal, analytic skills are improved through education (Edwards, 1986). Learning to see and to draw are ways to train the visual

system. Seeing relationships may assist one in accepting competing information that sometimes contradicts the verbal preprogrammed mode of the brain (Edwards, 1986).

The discipline of drawing is a teachable, learnable skill which can provide a twofold advantage. First, by using the part of one's mind that is conducive to creative, intuitive thought, you learn the fundamental skills of the visual arts, how to put it on paper, and the ability to think more creatively in other areas of your life (Brookes, 1986). Brookes (1986) reported that teachers who employed her method saw additional student improvement in handwriting, mathematics, and reading. Also positive changes in risk-taking, problem solving, self esteem and social skills were found.

Many art teachers do not think that art should be taught using intellectual mental disciplines. Art teachers only need to provide opportunities, exposure, materials, and give the spontaneity within each child free reign. These teachers deprive their students of the learning of certain basic cognitive skills (Engel, 1983). The visual arts provide a format in which students are motivated to work out problems and learn to focus. They also grow in their ability to expend the energy necessary to carry a project through to completion (Brookes, 1986).

At the turn of the century, a number of teachers and psychologists discovered that drawing skills could be learned following a step-by-step method. Children's drawings seemed to develop in natural and orderly steps from simplicity to levels of complexity (Wilson, Hurwitz, & Wilson, 1987). Brookes (1986) developed a sequential method of drawing to teach children how to draw before they reach this critical stage. Her method teaches how to gather information visually, elaborate on it mentally, and express it manually. This method involves training children to perceive visual data with an alphabet of five elements of shape, and demonstrating how the general shape of an object is composed (Brookes, 1986).

In order for children to learn to draw what they see realistically and depict the illusion of deep space, they must learn the basics of perspective, overlap, dimension, planes, and of converging lines. The prevailing rules for depiction of space are easily learned, if they are taught. According to Wilson et al. (1987) the prevailing rules of depiction of space can be easily learned if they are clearly taught. This would appear to conflict with the classic literature on depth perception (Gibson 1969; Walk & Gibson, 1961).

Teaching basic one and two point perspective drawing techniques allows children how to see forms diminishing in space. The importance

of children being able to see a three-dimensions object and how to interpret it on paper using two-dimensions is a learnable skill. These skills and sighting skills are cognitive processes that carry over to more complex drawings (Wilson et al., 1987).

The purpose of this study to extend the research which has shown that drawing and the visual arts are a process that can be successfully taught and learned by all students. The present paper also examines the effects a structured, systematic teaching style has on the quality of intermediate student's drawings. Finally, data were collected as to the applied or clinical significance (Kazdin, 1977) of the changes in the drawing skills of the participants.

Method

Participants and Setting

Two sixth grade classes (Class A, Control Group, Class B, Experimental Group) at a large public elementary school in rural Eastern Washington served as participants in the study. The classes were heterogeneously grouped with enrollments that ranged from 25 to 30 students. Both classes received art instruction from a qualified art specialist once a week for 55 minutes on a regular basis. Art was taught in a well-equipped art room in the school.

Response Measures

Three perspective drawing assignments were evaluated throughout the study by the art teacher employing a 10 point system. The evaluation system was constructed as follows: (a) utilization of space; (b) composition demonstrated a third dimension; (c) objects gave an appearance of depth; (d) placement on paper; (e) ellipse was correct at top of cylinder; (f) ellipse was correct at the bottom of the cylinder; (g) horizontal lines converge correctly; (h) vertical lines are parallel; (i) overlapping; (j) light source. Participants were given a point for each of these concepts which were applied in their drawings. Each of these were not weighted differentially. The mean scores for each class on each drawing were calculated for each of the three drawings for the two groups.

Clinical Significance

Kazdin (1977) suggested that another way to evaluate changes in student behavior is to have knowledgeable persons subjectively evaluate such behavior change. Both of these raters did not know which group had drawn which pictures they evaluated. Drawings from the pre-testing period and the post-testing period (N = 30) were given to two other art teachers to subjectively evaluate in terms of the students' ability to

demonstrate perspective. One of the teachers was the art teacher at another grade school, while the other was an art teacher at a middle school. The same 10 point rating system was employed. The two art teachers were unaware as to which testing period the drawings were taken.

Experimental Design and Conditions

A pre-posttest cross over design (Huck & Bounds, 1996) was used to evaluate the effectiveness of teaching perspective drawing. A description of the three drawing sessions follows.

Pre-testing. Participants in both sixth grade classes were assigned to draw a still life in the front of the art room. Various sizes of cubes and cylinders were arranged on a school desk, chair, and the floor. No specific instructions, time limits, or demonstrations were given. The drawings were turned into the teacher and evaluated on a 10 point system.

Post-testing Control Group. The control group received no systematic instruction and was assigned another drawing assignment the following week. These drawings were also collected and evaluated using the same 10 point system. This drawing was a three dimensional corner view of the art room and it's contents. The ceramic kiln, stove, computer table, several desks, chairs, wastebaskets, and boxes were visible to the participants.

Post-testing experimental group. The experimental group received two 55 minute lessons on various concepts of perspective drawing. Cubes on, above, and below the eye level were drawn using one and two point perspective. Participants observed boxes from these angles. Cylinders and cones were drawn using the same rules. The participants discussed how contour lines they could see on objects converged to vanishing points. Shading and the use of value when showing a light source was explained and demonstrated. A 14 minute filmstrip was shown on perspective drawing. The teacher demonstrated the concepts of perspective drawing using the chalkboard, and other visual aides during the training period.

The students also completed several exercises using step by step methods of perspective drawing in order to understand the concepts of perspective drawing. The students had a choice of drawing furniture, boxes, containers, or buildings.

The participants were shown how to draw the room to give a three dimensional look. Leonardo de Vinci's "The Last Supper" and other examples of well known artist's work were shown to the students. The students learned about sighting and practiced looking at what they saw. A viewer was used to focus on objects and cut out unneeded space so placement on the paper would look realistic. The teacher gave one on one

help when needed. The second drawings for the control group were collected and scored.

Posttest-2 control group and Follow up for the experimental group. After the experimental group had been trained, the first author sequentially trained the students in the control group. The same procedures used for the experimental group were then used with the control group.

Both groups were assigned to draw the same still life employed in the pre-testing period. They were asked to use as many of the perspective concepts as possible. They were given no set amount of time and their drawings were turned in when they finished. These drawings were evaluated using the same 10 point system as in the previous assignments.

Reliability

Three drawings from 10 participants (N = 30) chosen at random from each group were given to two other art teachers for regrading using the same 10-point scale. These scores were compared to those of the first author. Reliability of measurement was calculated by dividing the number of agreements by the total number of agreements plus disagreements and multiplying by 100. An agreement was defined if the author and the other two teachers agreed within one point in each direction from each other. A disagreement was scored if the discrepancy between the scores was greater than one. Reliability of regrading of the drawings was 96% (range 92 to 100%).

Results

The overall results indicated that the teaching of perspective drawing can improve the drawings of elementary school children. The mean pretest score was 1.57 (SD = 2.23) for the experimental group. The mean scores for the two pretest drawings (pretest-1 and-2) for the control groups were 2.25 (SD = 2.36) and 1.96 (SD = 2.03). After systematic training in perspective the scores of both groups improved.

A Wilcox on Matched Pairs Signed Ranks Test (Siegel, 1957) was carried out within the two groups across drawings (pretest to posttest-1 and follow up; pretest-1 to pretest -2 and pretest 2 to posttest for the control group). For the experimental group, there was a significant difference between the pre and posttest-1 scores ($Z = -4.042$; $p = .0001$). This difference was maintained for the pre to follow up ($Z = -4.3$; $p = .0001$). The comparison between posttest 1 and follow up was also significant ($Z = -2.188$; $p = .03$).

For the control group, comparisons between pretest-1 and posttest-1 were not significant ($Z = .783$; $p = .4334$; NS). However, after training, the scores of the control group improved on the posttest-2. This difference was significant ($Z = -3.982$; $p = .0001$).

Evidence that teaching basic perceptual and drawing techniques improves drawing in elementary students was found for individual students judged to have low, average, and high skills in drawing.

Clinical Significance

The two art teachers (blind to when the drawings were done) reported that 100% of the 30 randomly selected drawings from the posttesting period were rated higher than the 30 drawings from the pretesting period. Both art teachers found that all of the participants improved in their drawing skills from the pretesting to the posttesting period. A sign test for these comparisons was significant ($x = 0$; $p < .01$).

Discussion

The results of the study demonstrated that teaching drawing skills in a structured systematic way improves visual art skills in intermediate elementary students. The present study was intended to show that students will improve their drawing skills when taught certain visual and perceptual drawing techniques using a teaching method that is structural and systematic. Since all teachers reported improvement in the drawing skills during the post-testing period the study supports this hypothesis.

The findings in this study coincide with previous literature. The discipline of drawing is a teachable, learnable skill. Any normal person with average eyesight and average eye hand coordination can improve their drawing (Edwards, 1979). Drawing can be learned through a structured method similar to that of reading or mathematics. (Brookes, 1986). The results of this study demonstrate this way of thinking.

Another strength of the present research was the clinical judgments of knowledgeable art teachers could be changed with teaching children to draw with perspective was systematically taught. Several researchers in the behavioral literature have shown the objective changes in behavior should be followed by subjective changes in others perceptions their skills in handwriting (McLaughlin, 1981). Obtaining clinical or educational significance should be the goal of educational research (Kazdin, 1977). In the present study changes in both measures were found.

Many children tend to draw what they actually know, not what they see in front of their eyes. The ability to draw depends on the ability to see and to process visual information (Edwards, 1986). Our brains are

preprogrammed with stored knowledge. We know enough about what certain objects look like and attempt to draw them without looking and using "seeing skills" (Edwards 1986). Several examples of this dilemma were seen in the study.

Ellipses were drawn as circles because our brains appear to know the top of a garbage can is a round circle. Because objects sit on a flat surface the bottom elliptical curves are often drawn as straight lines. This information is preprogrammed and stored as a verbal information. Drawing this incorrectly is very common for even the more advanced drawing students (Edwards, 1986). It can be learned once a person consciously sees (Edwards, 1986). Often times students would look at the objects they were drawing and draw incorrectly. They would erase, look again, and draw correctly. What our brain tells us is a verbal process and what we see is a visual process. These are both two separate processes (Miller, 1983).

The positive outcomes of this study indicates that the imagination and expressiveness of an individual was not stifled. Learning to see may lead to the goal of greater creativity (Edwards, 1986). Visual, perceptual processes have been suggested to be central to creativity. When drawing you become more observant, curious, and images remain in your memory. The mind becomes a rich resource (Edwards, 1986). The participants that scored high on the pretest scored even higher during the post-testing period in both groups. The study showed that those who have innate ability gained from the experience.

The study indicates that learning visual art skills in a structured, systematic way is valuable to the learning process of children. Visual arts should be an important part of the school curriculum of intermediate elementary children. Because drawing is basic, (Beeching, 1987) in the teaching of the visual arts, teachers need to have a background in the subject themselves. We tend to teach as we have been taught (Ahmad, 1986). Teacher need to learn methods of drawing in art methods courses offered in their college teaching preparation.

In order for the American society to place a value in art and the education of the visual arts children need to learn how to observe and draw what they see (Edwards, 1986). Because 50% of the child's formation years are spent in school, teachers need to learn and develop an awareness of what art lessons should include (Ahmad, 1986). By changing the attitudes of future teachers, there will be a spiraling effect toward the attitude of many students (Ahmad, 1986).

Radical changes in the ways our culture conceives the visual arts and education is needed (Gross, 1983) in order for individuals in our society to reach their full potential (Brookes, 1988). The realization that the visual, global side of the brain's hemisphere contributes to the learning process of children, (Edwards, 1986) is a step in the right direction.

The positive results obtained is this study indicate that further research would be beneficial to the future of visual arts education. Future studies could attempt to find out how other cultures value the visual arts and how they contribute to the education of their society. Research could attempt to measure the positive attitudes toward learning when the visual arts are included in the educational process. A replication of this research could also be applied to the secondary level.

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