Perceptual Training in Drawing Among Students from Two Countries

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The purpose of this investigation was to measure and compare the effects of an experimental treatment as a strategy for teaching drawing to students from Jamaica and the United States. A total of 94 students averaging 13.3 years of age with a grade point average of 75.4 participated in this study. Two intact classes were selected from each country. Students from these classes were randomly assigned to one of two groups: control or experimental. Subjects completed a pre- and post-test of a Still-Life Drawing Test and a Goodenough-Harris Drawing Test prior and subsequent to the treatment. The SPSSX statistical package was used to analyze the raw scores generated from the evaluative tests. Findings indicated that the experimental treatment was successful as a teaching strategy for teaching drawing to students from Jamaica and the United States.

Introduction

Multi-cultural education is becoming necessary in our public schools because of the increasing migration of people from Asia, Latin America, North America, and Europe to the United States. Statistics released by the U.S. Department of Commerce (1987) indicated that in 1980 there were approximately four million Latin Americans residing legally in the U.S. The same document projected that people of a Spanish origin will increase from 16 million to approximately 31 million by the year 2000. With the expected increase in the different cultural groups and the effect it will have on the public school classrooms, teaching methodologies need to be modified to accommodate a more diverse cultural audience. This investigation focused upon multi-cultural art education, based on the assumption that if appropriate strategies are developed to teach students in multi-cultural groups, then the content in a curriculum designed for multi-cultural education will be more meaningful.

Several teaching strategies based on perceptual training have been considered successful in improving children's drawing performance. Lansing (1984) discovered that when children are given instruction on how to draw a figure, and practice drawing it for a number of times, their performance will improve. Burn (1975) found that both tracing photographs and/or doing contour drawings were successful strategies in improving students' drawing scores. Rennels (1969) conducted a study to identify instructional methods that were based on the disadvantaged urban Negro child's interest in concrete and motoric experiences. He concluded that children learn differently when responding to visual stimuli through discussion than through the use of a camera. Salome (1964) investigated the effect of instruction which required observing contour lines and locating points of maximum information when drawing from direct observation. The results indicated that directed perceptual training increased the amount of visual information included in children's drawings.
According to Wadsworth (1984), children in different cultures differ in their rate of maturation, social interaction, and physical experiences. Based on this theory, it seems logical that the drawings of children from different cultures would tend to be different. Several studies have demonstrated that this tends to be the case (Alland, 1983; and Anastasi & Foley, 1936; Brittain, 1985). Since cultural influences affect children's drawings, it is not known if drawing strategies which were successful with groups of American subjects would be successful with other cultural groups. To answer this question, it is necessary to compare different cultural groups' performances using a single teaching strategy. This study measured and compared the effect of an experimental drawing treatment upon the drawing performance by students from Jamaica and the United States.

Method

Subjects

Two groups participated in this investigation, one from eastern Jamaica and the other from the midwestern United States. These groups were selected because it was believed that the cultural differences among them were more distinct than it would have been between two groups from the same country. However, there were two noticeable similarities among the samples: (1) they were drawn from a diverse socioeconomic background (average buying power was similar in the respective communities) and (2) they were exposed to a general education. The obvious differences between these samples were underscored by the advances in modern technology in the United States: access to information, computerized classrooms, the latest in pedagogical practices, and the availability of materials.

The sample consisted of a total of 94 students from four classes which included boys and girls. The United States sample mean age was 13.2 and the grade point average was 75.4 on a scale of 0 to 100. Two intact classes of 25 students in one and 26 students in the other were selected from a midwest elementary school in a farming community of Illinois. These students were prepared, at this level, to enter a junior high school. Art was included in their general education but it was taught sporadically by classroom teachers who generally had very little art training.

Another two intact classes, one of which contained 21 students and the other 22 students, were also selected from a high school located in eastern Kingston, Jamaica. (The first three grades of the high school in Jamaica were equivalent to the upper grades of the elementary school in the United States.) Mean age for these students was 13.4 years; grade point average was 75 on a scale of 0 to 100. Unlike the United States students, the Jamaican students were prepared for the General Certificate in Education (GCE) examination or its equivalent. At the end of five or six years at the high school, if students were successful in the GCE, they would have an opportunity to attend university. Art is also included in the general curriculum for the high schools, and it is taught to all students by an art specialist.

Instruments

Two evaluative test instruments were selected and administered before and after the treatment period. The instruments were the Goodenough-Harris Drawing Test and the Still-Life Drawing Test.

Goodenough-Harris Drawing Test (1963): The Goodenough-Harris Drawing Test was selected to determine the inclusion of detail, the accuracy of indi-
individual parts, the use of perspective (foreshortening) and proportion of the hu-
man figure. This test was administered by instructing the subjects to draw a
person on the test sheet within a 10-minute period. The GHDT is applicable to
children between the ages of 5 and 15 years.

Still-Life Drawing Test: A simple still-life arrangement was used for the
Still-Life Drawing Test. This arrangement was used to measure the students’
ability to visualize and graphically manipulate three-dimensional forms. In
addition, the SDT measures the student’s ability to graphically represent de-
tails, perspective, and proportion among objects. This drawing test was in-
cluded because (1) the major forms could clearly be defined with lines and (2)
a three-dimensional arrangement provided drawing problems with a higher
degree of difficulty than a two-dimensional one.

To ensure consistency, the Still-Life was arranged prior to testing and was
recorded photographically. The photographic slides were used as a reference
to set up the Still Life at each test site. Subjects were also assigned the same
position for drawing the Still Life in the pretest session as well as in the posttest
session.

In the Fall of 1985, the still-life treatment instrument was administered on a
pilot test basis at an American university-affiliated elementary school. Follow-
ing an analysis of the pilot data, modification was made in the treatment in-
strument. This instrument was evaluated on six criteria as follows: accuracy of
placement and scale of objects drawn, continuous lines, smooth flowing lines,
utilization of the picture plane, inclusion of textural qualities, and the creation
of depth in the drawing. Each of the five criteria listed above was scored on a
one through four scale that indicated the degree to which a drawing may have
achieved that criterion.

Procedure

Two intact classes were selected from each participating country. The cri-
teria used for selecting the classes were subjects’ age and grade point average.
Grade point average, in this case, is the mean score for English language,
mathematics, and general science. These subjects were chosen because the
grades of students from both samples showed some similarities. This was im-
portant because it reduced the influence that chronological development and
academic achievement might have had on the outcome of this experiment.

Students from the intact classes were randomly assigned to the experimental
and the control groups using a table of random numbers. Both the experi-
mental and the control groups were administered a pretest and a posttest prior
to and after the treatment. While the treatment was being administered to
subjects in the experimental group, subjects in the control group attended reg-
ular classes.

Five sequential demonstrations and 11 art activities which emphasized
contour-line drawing techniques were completed over a 5-day period. The fol-
lowing is a breakdown of the experimental treatment activities:

Day One: Subjects were asked to perform two separate tasks: the pretest and
the first experimental treatment. The pretest consisted of the SDT and the
GHDT. For the first day experimental treatment, the subjects completed three
exercises: (1) tracing of their own hand, (2) a contour drawing of their hand in
space, and (3) a blind-contour drawing of their hand in space.

Day Two: Subjects were asked to complete three drawings. They were: (1)
an outer contour line drawing of a crumpled brown paper bag, (2) a con-
continuous-line drawing of both the inner and outer contour of a crumpled brown paper bag, and (3) a blind continuous line drawing of the inner and outer contour of a crumpled brown paper bag.

**Day Three:** There were two drawing activities completed on day three. Subjects were asked to complete: (1) two, 2-minute contour drawings of a wooden chair and (2) two, 2-minute continuous-line drawings of a wooden chair, including its surface quality.

**Day Four:** Three drawing activities were completed during the fourth day. Subjects were asked to do: (1) a continuous-line drawing of a still life including the outer and inner contour of the objects, (2) a continuous-line drawing of a still life including the proportion of objects, and (3) a continuous-line drawing of a still life including the surface quality and proportion of objects.

**Day Five:** Before the posttest was administered, subjects were asked to complete a drawing of an activity taking place on their favorite holiday. This was used as a "psychological break" between the treatment activities and the administration of the posttest. After a short break, the posttest was administered. For the posttest, the SDT and the GHDT were repeated as in the pretest.

**Results**

Three judges were used to rate the subjects' drawings. Two of the judges were American, one male and one female. The male was a studio artist, a specialist in drawing, and the female was an art educator. The third judge was a male art educator from Thailand. A Jamaican judge would have been the logical choice, but there were difficulties in scheduling the training and scoring sessions. Steps were taken to reduce the possibilities of judges' biases by coding and mixing pre- and posttest drawings prior to scoring them. In addition, this scoring procedure minimized the inconsistency that may have occurred due to the judges' fatigue. Interrater reliability coefficient was .85, determined by using Cronbach's Coefficient Alpha statistical procedure.

Pre- and posttest drawing scores for the experimental and the control groups were compared using T-tests to determine significant changes in drawing performances. Results for the experimental groups indicated that the difference in mean scores was .33 for the pre- and posttest of the SDT. This score was significant at $p < .05$. The GHDT had a difference in mean score of 2.23 which was not significant ($p > .05$). Scores for the control groups were not significant. A summary of the dependent $t$-test results for the experimental and control groups can be seen in Table 1.

An independent $t$-test was used to determine significant changes in drawing performances between the American and the Jamaican samples. Results indicated that gain scores were as follows: SDT, .14 and .20; and GHDT, -.92 and 2.02. All these scores failed to reach significance at $p > .05$, meaning that the numerical differences observed between the two samples could have been caused by chance. Table 2 presents a summary of the pretest, posttest, and mean gain scores of the SDT and the GHDT for the American and the Jamaican samples.

There were three objectives for this investigation: (1) to determine the effectiveness of the experimental treatment as a teaching strategy for students from Jamaica and the United States, (2) to determine if the experimental treatment had a positive impact on students' ability to visualize and draw three-dimensional objects on a two-dimensional picture plane, and (3) to determine if experiences gained through the experimental treatment would lead to im-
Table 1. Differences in Pre- and Posttest Achievement for the Experimental Group (dependent t-test results)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
<th>Pretest Mean</th>
<th>Posttest Mean</th>
<th>Difference in Mean</th>
<th>Pre SD</th>
<th>Post SD</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Still Life</td>
<td>Experimental</td>
<td>2.22</td>
<td>2.55</td>
<td>.33</td>
<td>.43</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>2.31</td>
<td>2.31</td>
<td>.00</td>
<td>.41</td>
<td>.35</td>
<td>.98</td>
</tr>
<tr>
<td>Draw-A-Man</td>
<td>Experimental</td>
<td>98.59</td>
<td>100.83</td>
<td>2.23</td>
<td>10.77</td>
<td>12.74</td>
<td>.10</td>
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<tr>
<td></td>
<td>Control</td>
<td>100.85</td>
<td>99.47</td>
<td>-1.38</td>
<td>10.34</td>
<td>12.87</td>
<td>1.00</td>
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</tbody>
</table>

aNumber of cases = 47
b p < .05

Table 2. Achievement for the American (N = 51) and Jamaican (N = 43) Samples (independent t-test results)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
<th>Pretest Mean</th>
<th>Posttest Mean</th>
<th>Difference in Mean</th>
<th>SD of M</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Still Life</td>
<td>American</td>
<td>2.12</td>
<td>2.26</td>
<td>.14</td>
<td>.42</td>
<td>-0.78</td>
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<td></td>
<td>Jamaican</td>
<td>2.43</td>
<td>2.63</td>
<td>.20</td>
<td>.40</td>
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<td>Draw-A-Man</td>
<td>American</td>
<td>95.04</td>
<td>94.12</td>
<td>-0.92</td>
<td>10.95</td>
<td>-1.50</td>
</tr>
<tr>
<td></td>
<td>Jamaican</td>
<td>105.28</td>
<td>107.30</td>
<td>2.02</td>
<td>7.45</td>
<td></td>
</tr>
</tbody>
</table>

Two evaluative test instruments — SDT and GHDT — were used to determine the achievement or nonachievement of the above objectives. The SDT instrument was selected to determine if the treatment was effective as a teaching strategy, and if it had positive impact on students' ability to visualize and draw three-dimensional objects on two-dimensional picture planes. Results indicated that the experimental treatment was statistically significant in improving still-life drawing performance among American and Jamaican students. Drawing performance included the visualization and manipulation of three-dimensional forms and the graphical representation of detail, perspective, and proportion of objects. This result is consistent with the finding of Lansing (1984) who stated that instruction and practice do improve children's draw-
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ings. However, it is inconsistent with the findings of Mitchelmore (1980) who argued that students from developing countries, such as Jamaica, had lower spatial and three-dimensional drawing ability than students from a corresponding educational level in England and the United States. According to Lansing (1984), instruction and practice do improve children's mental images of objects. Based on this finding, it is believed that perception of objects could also be influenced by training. Therefore, with the use of improved pedagogical practices among specialist teachers of art in third-world nations, children may have improved their spatial and three-dimensional drawing ability.

When students' still-life drawing performance was analyzed by culture, there were no statistical differences found. This may suggest that students' responses to the treatment were not influenced by their culture. Yet, several cross-cultural studies have found strong cultural influences in children's drawings (Anastasi & Foley, 1936; Brittain, 1985; and Koppitz, 1984). Bagby (1957) pointed out that the types of experiences children are exposed to can determine the quality of their perception. Alland's (1983) cross-cultural study findings support this theory. He stated that Japanese children's sophistication in drawing the human figure resulted from intense art training. There were numerical differences between the pre- and posttest scores for the SDT. It may be that there was an immediate response to the experimental treatment by students from both samples, but because the time period between treatment and testing was five days, students may not have incorporated the new information acquired into their respective cultural modes, thus resulting in the nonsignificant differences found between mean drawing scores for the American and the Jamaican samples.

The GHDT instrument was chosen to determine if students would readily utilize the experiences gained from the treatment to improve their human-figure drawing. Results indicated that the experimental and control groups' achievement was statistically the same. Numerical differences observed in the mean scores for the experimental and control groups indicated that the subjects were responsive to the drawing treatment. Consequently, it is believed that more time may have produced statistically significant results. When the American and Jamaican samples were compared, the results were also not statistically significant. This could signify that the experiences gained from the experimental treatment by subjects did not lead to improved drawing of the human figure. Harris, in a cross-cultural study (1963), argued that garb, vehicles, implements, actions portrayed do not influence the GHDT scores. He also stated that because certain body features were influenced by garb, there should be a restandardized scale to evaluate every group having distinct characteristics (dress, mode of living, and level of education). Because of these conflicting statements, it is believed that the GHDT may not have been accurate in determining students' human-figure drawing scores.

To summarize, this investigation found that the experimental treatment was successful as a teaching strategy to teach still-life drawing to American and Jamaican students. The results from this investigation also found that the drawing strategy employed had a positive impact on students' abilities to visualize and draw three-dimensional objects on a two-dimensional picture plane. Although results from this study indicated that experiences gained from the still-life drawing strategy were not immediately applicable to human-figure drawing, it is believed that if more time were made available between treat-
ment and testing this result could change. Subsequently, it is recommended that further research be undertaken in this area to provide more information that can be used to improve this method for teaching drawing.

References


