

Analytic Thinking for Children In Fort Worth
Elementary Schools: Initial Evaluation
Report Summer 1981

Since September of 1979, Texas Wesleyan College's School of Education has been running a program called "Analytic Thinking for Children" (A.T.C.). The program is based on one developed by Matthew Lipman of the Institute For The Advancement of Philosophy for Children. Both Lipman's Philosophy for Children (P-4C) program and Wesleyan's program use the tools of philosophy and logic in an attempt to improve children's thinking, increase their interest in things academic and improve their scores on standardized tests - specifically, improve their scores on the reading and mathematics sections of standardized tests.

During the academic year 1979-1980, two fourth grade teachers in two Fort Worth Public Schools took a six-credit graduate course in A.T.C. and taught, with the occasional help of an A.T.C. instructor, their own group of fourth graders. Each group met twice a week for forty minutes per session. The main text used in the class was Harry Stottlemeier's Discovery. In teaching the class the teachers also used the instructional manual, Philosophical Inquiry, that accompanies Harry.

The teachers appeared to have a good deal of success in the first year. They reported that the quality of the classroom discussion seemed to deepen and improve. Further, the children claimed to enjoy the program. However, there was no formal evaluation reported for this pilot program. Indeed, the agreement reached by Texas Wesleyan College and the Fort Worth Independent School District was that the progress of the program would be evaluated, in the first year, by mainly informal means. Parents, teachers, principals,

students and representatives of the college were asked to say whether they thought the program was a worthwhile one.

During the course of the first year, the reports were quite positive and the program expanded to include two more teachers and four more classes. At the end of the first year, the informal evaluations continued to be positive and fourteen new teachers were added to the program for the 1980-81 academic year. These new teachers implemented the program in their classrooms. Approximately thirty-five other teachers were enrolled in the six-credit graduate course. The fourteen new teachers were teachers who had taken the course the previous year.

The formal evaluation of the program began during the 1980-81 year. Two classes, with 25 and 26 students respectively, were selected on the basis of their being current students of teachers who had completed one year's training in A.T.C. These classes were made up of students who had all scored above the seventy-seventh percentile on the Iowa Test of Basic Skills. Classes made up of such children are called "Vanguard" in the Fort Worth Independent School System. "Vanguard" classes represent an attempt on the part of the Fort Worth I.S.D. to give students enrichment opportunities, to deepen their understanding of the ordinary curriculum, to expose them to a foreign language, etc. Two "Vanguard" classes, with 18 and 17 students respectively, in neighboring schools were selected to serve as control classes. These classes were conducted by teachers who were not trained in A.T.C. As in the previous year, teachers of the test classes met their students twice a week, forty minutes per session to teach analytic thinking.

In October, all four classes were pretested using Lipman's and Virginia Shipman's Q-4 test on reasoning skills. The fifty-five

question test was administered over a two-day period (one hour per testing session) by the classroom teacher. In late April and early May, the same four classes were posttested using the Q-4 instrument. The results of an analysis of the test scores and questionnaire data are presented below.

In order to answer the question of whether students in the A.T.C. program significantly improve in reasoning skills compared to control students, the Q-4 test scores were analyzed. The results of the Q-4 test, which is designed to assess the reasoning skills of children, indicated that the students in the A.T.C program did significantly improve in comparison to the control students. The following figure displays the means for the two program and two control classes.

Insert Figure 1 - here

As the figure suggests, the two A.T.C. program classes experienced the greatest average change in test scores from the pretest to the posttest with mean changes of -13.73 and -9.77. The control classes exhibited mean changes of -0.78 and -5.53. These changes indicated that the program students answered significantly more test items correctly or missed fewer at the posttest than did control students. A closer examination of the four classes pretest scores reveals that one of the control schools (Class 4) scored considerably lower at the pretest than did the other control or program classes. It was discovered after it was too late to recruit another control class that this class was in a special "magnet" school which attracted and admitted only students who were both gifted and highly motivated. In light of the uniqueness of the students in this class and because of the lack of pretest equivalence, it was not included in the statistical analysis report below. (Note: The inclusion of this

unique class would have only made the results even more significant, albeit somewhat distorted, because of the almost total lack of change in Q-4 test scores from pretest to posttest.)

A One-Factor Analysis of Variance was performed on the pretest Q-4 test scores of the three remaining classes - one control (Class 3) and the two program (Class 1 and 2), to determine their pretest equivalence. The analysis indicated no significant difference between the three pretest means ($F = 2.08$, $df = 2$ and 66 , $p > .10$). This result allowed us to treat the three classes as equivalent groups. Moreover, the same statistical analysis was then performed on the posttest Q-4 test scores of the three classes. This analysis allows us to answer the question posed earlier: Did the students participating in the A.T.C. program compared to the control students significantly improve their test scores? The results of the analysis indicated that there were some significant differences between the means of the three classes ($F = 10.48$, $df = 2/66$, $p > .001$). An examination of the posttest means for these classes indicate that the A.T.C. program, in fact, significantly improved test scores compared to the control students.

The two A.T.C. classes had Q-4 mean test scores of 9.92 and 9.23 respectively, while the control class had a mean of 14.76. These results show a significant improvement in Q-4 test scores of the A.T.C. classes over the control class.

At the end of the school year, the children in the A.T.C. program classes were asked to express their attitudes toward the program by completing a questionnaire (see Thinking Vol. 1 No. 3 and 4). The percent of students falling in each answer category is presented in Table 1 below. The following is a report of the children's attitude

toward the program.

Insert Table 1 - here

Additional analysis of the program's possible effect on scores on national standardized tests are still being compiled and analyzed. They will be published as soon as they become available. What can be said at this point is that the program does seem to serve two important functions. It does seem from the present evaluation to have a positive effect on children's thinking skills, and it does seem to be a program which children enjoy.

Ronald Reed
Allen Henderson