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A STUDY OF STUDENT ATTITUDE AND ACHIEVEMENT IN AN ALTERNATIVE FUNDAMENTAL PUBLIC SCHOOL PROGRAM

By

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ABSTRACT

A STUDY OF STUDENT ATTITUDE
AND ACHIEVEMENT IN AN ALTERNATIVE
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The purpose of this study was to compare the academic achievement and attitude toward school of students in an alternative fundamental school program with students in a regular school program. The subjects were 140 male and 130 female students in grades one, two, and three from two public elementary schools in the Saginaw Township (Michigan) Community School District.

The research methodology used to evaluate academic achievement was the non-equivalent control group pretest-posttest design. Data was obtained from several levels of the Comprehensive Tests of Basic Skills which evaluated achievement in reading, language, mathematics, as well as total battery. The School Sentiment Index measured students' attitude toward school. The three-way analysis of co-variance was used to determine relationship of program, grade level, and sex for academic achievement. Analysis of variance was used to evaluate the attitude toward school of the students. Post hoc comparisons consisted of t-tests for independent means to determine rejection of null hypotheses. A two-tailed probability level of .05 was set for the

inferential testing of all null hypotheses in the study.

The analyses showed that mean performance increase for the academic achievement of all students in the sub-test areas of reading, language, mathematics, and total battery was not related to student participation in either the alternative fundamental school program or in the regular school program. However, fundamental school students at the first grade level performed at a statistically significant higher level in reading than first grade students in the regular school program.

The attitude toward school expressed by fundamental school students at the end of their participation in the program was significantly higher than that expressed by regular school students. The data indicated this was true for both male and female students.

The results of this study are in line with most past research regarding alternative educational programs. Further research was recommended to investigate long term participation in an alternative fundamental program and to analyze the instructional conditions which influence academic performance in such a program.

To Mary Kay, of course.

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CHAPTER I

THE PROBLEM

Introduction to the Problem

During the last decade, American education has experienced the emergence of alternative schools as a strategy for reform with the potential to improve public education. In its infancy, the term "alternative school" often referred to voluntary, experimental programs which emphasized parental and student involvement in decision making as well as student self-discipline and motivation. According to Fantini (1972), in the early 1970's the alternative public schools were "the only major movement in American education." This movement developed as a response to the educational concerns of individual communities rather than as a response by the mainstream of the profession to a concern for the national interest (Smith, 1973, p. 434). Alternative schools have been a grass-roots level thrust in public education to provide options and a strategy for making schools more responsive to the demands of parents who seek a different educational environment for their children as opposed to that prevailing in the traditional school. No exception to this reform strategy is the conservative back-to-basics fundamental public school alternative to the regular schools.

The basic education movement of the 1970's accompanied the alternative school movement into the 1980's and its impact on American education has been widespread. Both

movements are unique in that they originated among parents, citizens, and educators at local levels, rather than resulting from national or state models. The trend of higher tax levies being funneled into public education has often resulted in parental demands for higher achievement results in the three R's or other basic subjects. This concern is due in part to the fact that school patrons increasingly receive information concerning students' declining SAT scores, deteriorating discipline, and the apparent failure of education innovations (Weber, 1975, p. 45). Those individuals critical of traditional education programs for not meeting the social, emotional, and academic needs of students often look upon alternative fundamental school programs as the kind of experience they remember from their earlier schooling (Shaw, 1975). This recollection is one of a less society-oriented school which concentrated on teaching children to read, write, compute numbers, and behave—things that many public school programs have had difficulty in maintaining over the last two decades.

Fundamental schools have been one of the major growth areas among alternative school types in the late 1970's and early 1980's. Lynne Miller, a staff member of the National Alternative Schools Program of the University of Massachusetts, thinks that the fundamental schools may have a significant impact. They have "fostered a split in the whole alternative movement," she says, and although she would hate to see such schools replace those that stress internal

motivation, self-discipline, and a less structured atmosphere, she claims "there are going to be a lot more fundamental schools" (Miller, 1975, p. 39). Miller sees this broadening of options as a healthy development, breaking away from the "traditional school monopoly" which offered no choice. Vernon Smith (1981) of the University of Indiana reports that fundamental schools are increasing at a faster rate than any other kind of alternative education today.

For years, private and/or parochial schools have offered a basic school program as an alternative to the traditional public school curricula. It is apparent that as part of the alternative school movement, fundamental schools have become one of the educational options provided in many public school districts throughout the country. The rapid growth of alternative fundamental schools gives rise to the concern that a philosophical basis is often used as a criteria for their implementation. Despite the impact of the back-to-basics movement and the growth of fundamental schools, there are relatively few studies available regarding the attitude and academic achievement of students who have been exposed to this educational alternative. Empirical information appears to be not only limited but also seldom considered as a motive for the existence of this type of alternative school organization.

With a concern for current objective information about alternative school approaches, this study was designed to compare the attitudes and academic achievement of students

in an alternative fundamental school program with students in the traditional program, both part of the Saginaw Township (Michigan) Community School District during the 1982-83 school year.

The approach used in assessing the results of student participation in the alternative fundamental school program is theory-based. The fundamental school philosophy is one which places an emphasis on the basic skills of reading, writing, and math computation. In addition, authority of the classroom teacher and strict discipline procedures are promoted. A theory of learning prevails which views academic time on task and elimination of curricular "frills" as critical to attaining good results toward which the program aims. Essentially, advocates of the fundamental school program believe that to master the basic skills of continued learning, a structured, academically-oriented environment must be maintained.

Need

Politically, common elements characteristic of fundamental schools have been and will most likely continue to be supported by many school patrons as their objectives have been firmly accepted in many communities. The 1976 Gallop Poll on education revealed that fifty-five per cent of respondents would send their children to schools with strict discipline codes and strong emphasis on the three R's, both earmarks of the fundamental school philosophy (Enochs, 1979).

It seems that each succeeding Gallop Poll on K-12 education has cited academic standards and discipline as major concerns. Wellington (1977) cites discipline as the core of most of the problems in American education, because without discipline there will be no learning. He views the fundamental school as a viable alternative in achieving the basic purposes of education partly because it augments the home support needed to maintain good discipline and responsible attitudes. School board respondents to an American School Board Journal Ballot Box (1975) voted overwhelmingly (nine to one) in favor of establishing fundamental schools as alternatives to regular schools and experimental schools. In like manner, an NEA research teacher opinion poll (1980) showed that ninety per cent of public school teachers favored increased emphasis on basic curriculum, setting higher standards, maintaining stricter discipline, and teaching moral and social values. Most parents, students, and teachers who try fundamental school programs seem to like them and appreciate being offered the option these schools represent (Jones, 1976).

However, whether alternative fundamental schools have implemented their promises of improved performance in the curricular areas of reading, writing, arithmetic, and behavior is not clear. There have been claims of success, but few evaluations have been published and there has seemingly been no systematic effort to collect, analyze, and summarize the studies that are available. Because the fundamental

school movement is still in its early stages and individual school studies are often formative evaluations designed to identify areas for improvement, it is possible that such reports are considered confidential to the school system and are not published in the media.

Since fundamental schools have been elevated to the position of being a recognized factor in American education, it is important that the claimed impact on student academic achievement and attitudes be evaluated. Moreover, the development and use of alternative fundamental schools will eventually dictate evaluation nationally as well as with individual schools in local school districts. In partial expectation of those needs this research study was designed to provide information and understanding of one such program, the alternative fundamental school program in Saginaw Township, Michigan. The study was structured to provide insight into the impact of a fundamental school program upon early elementary student academic achievement and attitude in its initial stages of operations.

Purpose of the Study

The researcher's purpose in this study is to compare the academic achievement and attitudes of first, second, and third grade students in an alternative fundamental school program with a control group in the Saginaw Township Community School District. The evaluation procedure and analysis will provide

empirical data as to whether materials and methods used to implement a fundamentalist school philosophy do produce a significant difference in student academic achievement and attitude.

Significance of the Study

Since little research and evaluation of the fundamental alternative school concept is available in the literature, it would appear that a study of the concept is both timely and appropriate. As it is important that alternative fundamental schools be assessed in order to make valid generalizations about their educational programs, the author was professionally convinced to study the academic achievement and school attitude gains made by students in a fundamental school setting during the initial year of the program's implementation. Since the alternative fundamental school program of the Saginaw Township Community Schools, which was evaluated in this study, is similar in philosophy to many implemented nationally, the results are expected to be of value in the following ways:

1. Data derived from this study may be used to help determine whether to continue the fundamental school program in Saginaw Township at the middle school level.
2. Data derived from this study may serve as a basis for curriculum change in specific areas in the Saginaw Township Community School District.

3. Data derived from this study may provide insights and information helpful to other school districts in the state or nation which have a fundamental school program or are planning to implement one in the future.

Hypotheses

The major research objectives to be investigated in this study are expressed by the following hypotheses written in broad research form. These hypotheses are restated in more specific testable form in Chapter III along with the research questions from which they were generated.

1. Students in the alternative fundamental school program will attain higher academic achievement gain scores at the end of treatment than will students in the regular school program.
2. Students in the alternative fundamental school program will attain higher attitude toward school mean scores at the end of treatment than will students in the regular school program.

Definition of Terms

It is important to know the explicit meaning of a term in order to evaluate research or determine whether the researcher has realized a valid response to a stated problem. The following terms have been used in this research study in

accordance with the operational definitions provided.

Academic Achievement: Knowledge obtained or skills developed in school subjects—designated in this study by an individual's subtest and total battery scores on the Comprehensive Test of Basic Skills.

Alternative School: A school which contains a competing educational philosophy to that of the traditional school, providing an additional choice for parents and students.

Analysis of Co-Variance: An analysis procedure in which adjustments are made in data for the criterian variable. It essentially adjusts statistically the effects of differing pretest scores from the posttest.

Attitude toward School: An individual's score on the School Sentiment Index, primary level.

Back-to-Basics: A philosophical term which places emphasis on reading, mathematics, and language arts instruction, stressing basic skills mastery.

Basic Education: An educational program based on unspecialized knowledge, skills, and understandings deemed necessary for effective living.

Control Group: A group consisting of students who are similar to the experimental group, are measured at the same time, but do not receive the experimental (fundamental school) program.

CTBS: The Comprehensive Test of Basic Skills, used in this study to provide measures of academic achievement in three major subject areas: reading, language, and mathematics.

Experimental Group: A group consisting of students who receive the program which is to be evaluated.

Fundamental School: An alternative public school whose educational philosophy is earmarked by the teaching of basic skills, use of textbooks, regular homework, strong discipline, citizenship and character building, accountability and parental commitment.

Performance Increase: The increase in CTBS scale scores from pretest performance to post-test performance.

Regular Classroom: A classroom designated for regular academic work as opposed to classrooms used for special or innovative work.

Scale Scores: The basic score of CTBS, these are units of a single equal-interval scale that is applied across all CTBS levels ranging from 0 to 999. The equal-interval property of scale scores makes them especially appropriate for various statistical purposes.

Traditional School: A school following the standard education traditions of the last century, where innovation and experimentation are minimal.

Limitations of the Study

Certain limitations exist in this study and the extent to which the findings can be generalized is restricted by these limitations.

1. The sample of this study is limited to students

enrolled in the fundamental school program and the regular school program at two elementary schools in the Saginaw Township Community School System during the 1982-83 school year.

2. Assessment of the cognitive domain is limited to student scores obtained from the Comprehensive Tests of Basic Skills (CTBS).
3. Assessment of the affective domain is limited to student scores derived from the School Sentiment Index.
4. In all measurements of students obtained for this study, precautions were taken to obtain valid reactions so that any interpretation is based upon genuine, sincere, student performance and response. In all attitude instruments requiring self-response, truthfulness of response is an issue and therefore interpretation should be made accordingly.
5. Prior experiences and attitudes of students in the study are assumed to be similar and typical for the grades, schools, and community.
6. Teachers in the fundamental school program and teachers in the regular school program taught in these schools the previous year and were assumed to be equal in ability.
7. Student awareness of participation in an experimental program may have made the study vulnerable to the Hawthorne effect. It was assumed, however, that after a year's exposure to the program, this effect was reduced.

Summary and Overview

This research study consists of five chapters. In Chapter I, information concerning the need, purpose, significance, and limitations of the study are presented as well as hypotheses to be tested and a definition of terms. The relevant literature is reviewed in Chapter II. The design of the study is described in Chapter III, including the sample, measures, testable hypotheses, and statistical analysis instruments. In the fourth chapter, the analysis of the results is presented. In Chapter V, the summary and conclusions are discussed as well as implications for future research.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The public school systems of the United States are now entering the second decade of fundamental schools as an alternative educational program to the more traditional school curricula. Beginning with the first fundamental alternative in San Geronimo, California in the early 1970's, other fundamental schools have been established on a regular basis at the urging of parents or board members throughout the country. The visibility and economic success of fundamental schools are good indicators that they will continue to exist and develop. It also appears that in communities where fundamental schools are founded, there is substantial support from parents, students, and teachers to make this educational alternative a welcome addition.

Traditionally, private and/or parochial schools have offered basic education alternatives to the traditional public school curricula. Now many alternative fundamental public schools have been established based on the premise that they are the answer to parental concerns in regard to teaching children to read, write, compute numbers, and behave. It still is not clear whether the fundamental schools have been able to fulfill such expectations, for although there are claims of success, insufficient research-supported information is available to warrant an overall evaluation of

their effectiveness. In this review of related literature the philosophy of the basic education movement in the United States will be examined as well as the impact of alternative educational programs in the last decade. An ERIC search was initiated through the Michigan State University library to help identify selections of the literature pertaining to the topic of this study and to provide the basis for an indepth investigation of those studies having a direct relationship to fundamental schools and the achievement of the students who attend them.

Review of the Literature

The idea of a basic education philosophy and a limited curriculum, earmarks of the fundamental school, certainly are not new. For most of the history of formal education, teachers and philosophers have believed in it (Weber, 1975). During the last ten to fifteen years, the concept of basic education has come to the forefront of educational issues. Its impact, often led by parents, ministers, business people, and politicians, has put many an educator on the defensive. Those supportive of the fundamental school concept contend that today's students are not learning basic skills, classroom discipline is lax, and curricula are suffering an influx of frill subjects. With the demand for a return to traditional ideals and fundamental concepts in education widely proclaimed, Ham (1982) reported that parents who send their children to fundamentalist Christian schools believed

that public schools were academically inferior and discipline had broken down.

The back-to-basics movement of the 1970's parallels the emphasis on subject matter and the intellectually rigorous curriculum of the late 1950's and early 1960's (Donmoyer, 1979). Both movements were spawned by dissatisfaction with what communities perceived as nonrigorous, overly child-centered schools. However, Donmoyer notes that while the earlier educational movement arose in an era of new frontiers, this latest movement advocates a retreat to older values. The earlier demand was for excellence while this latest demand is for adequacy. A major concern is that students who are already academically adequate may be ignored at a time when they may require subject matter challenge and teacher expectations of excellence that were central concerns of the earlier movement. It would seem apparent that the back-to-basics movement of the 1970's had a strong impact on the growing popularity of fundamental schools.

At present, the basic education movement lacks conceptualization, but at various times and places, back-to-basics advocates have demanded: 1) renewed emphasis on reading, writing, and arithmetic; 2) directive authority for the classroom teacher (together with a corresponding decline in pupil-directed activities); 3) elimination of curricular "frills" and elective courses; 4) elimination of the school's "social services"; 5) a moratorium on "nontraditional"

curricular and programmatic innovation; 6) procedures calculated to enhance schools' accountability for learning outcomes; 7) increased emphasis on vocational-related instruction and curricula; 8) inculcation of "core values" thought essential for maintaining societal stability (e.g. patriotism, respect for tradition and authority); 9) strict discipline and control; 10) implementation of pedagogy centered on drill, recitation, daily homework, and frequent testing; 11) enhanced community control over schools and; 12) reduction of school costs (Lucas, 1978).

Beyer (1978) reports that the evidence indicates that action to improve reading comprehension and writing is needed and the demand for back-to-basics in these areas is justified. Concerted action, not rhetoric, is needed and can be provided in a variety of inexpensive ways. He feels the most realistic and productive approach to improved instruction in reading and writing builds on resources and opportunities already existing in our school systems.

Since back-to-basics covers a large range of philosophical convictions, it is not unusual to find that educators may embrace some of them while rejecting others. Educators counter simplistic demands for the three R's with what Brodinsky (1977) calls a new educational trinity: 1) minimal competency, 2) proficiency testing, 3) a performance-based curriculum. These technical goals are clustered with philosophical aims and concepts with which educators are working on at a slow but steadily increasing tempo. While

some school boards are pushing their schools to get on the "basics tract," many await a national pattern to develop or for state laws to formulate minimum expectancies codes. What does appear to be happening is that fundamental alternative schools are causing some changes in conventional school philosophies from the middle-of-the-road toward the right or more conservative position. For example, in Pasadena, California, where several fundamental schools are in operation, reading is being emphasized throughout the district and reading scores of Pasadena students have improved. Leonard Blanard, principal of the Panama "Academic Plus" School, an alternative fundamental school in Cupertino, California, notes that increasing numbers of conventional schools in his district are trying out some of Panama's techniques (Nation's Schools Report, 1976). It appears that many administrators who cannot accept the entire back-to-basics philosophy are incorporating some parts of it into their regular programs. Down (1977) notes that fundamental schools are having an influence on other schools in their districts. To compete for student enrollments, other schools are paying more attention to student achievement, orderly environments, and sequential curricula.

There are obvious parallels between philosophical tenets for back-to-basics and the expressed goals of most existing alternative fundamental schools. These goals can usually be lumped into five general categories: 1) to master the basic skills for continued learning; 2) to know and

understand one's history, heritage and government structure, and to reason in a logical and objective manner; 3) to challenge each child to do his/her best; 4) to insure accountability; 5) to reinforce parental teaching of citizenship, respect, discipline, and personal responsibility (Jones, 1976). Most fundamental schools also stress the use of textbooks, homework, dress codes, and patriotism. In summary, at fundamental schools formal structure, rigid rules, and authoritative discipline prevail (Neill, 1976).

A study by Bonds (1979) was initiated on the nature of fundamental schools. He sought to identify the existence of alternative fundamental schools, to determine a set of characteristics of such schools, and to provide information, concepts, and insights that would be helpful to educational managers who have the responsibility to affect change from a conventional school program to a fundamental program of instruction. Participants in the study were fifteen building and four central office administrators from seven school districts. A questionnaire was designed to measure the characteristics of the alternative fundamental schools as well as a six item interview guide to identify incidents in the developmental process of the schools. The findings of this study were:

1) The initial effort to establish the school program originated from interested members of the community.

2) All districts offered ability grouped, self-contained classrooms for K-6 and departmentalized instruction for 7-12.

3) Teaching experience of the majority of the teaching staff ranged from 6 to 15 years.

4) Teachers' attitude was considered the most important factor in effectiveness.

5) Changes in the instructional program were reported as being significantly changed from the conventional program except for curriculum development and scheduling.

6) Parents selected the alternative fundamental school so that their children would be exposed to a more disciplined school environment.

7) Administrators believed their school's contribution permitted parents to practice the philosophy of education to which they subscribed.

8) Parental support of the school was the single most positive development in the school as a result of implementing the fundamental school program.

Other conclusions that Bonds drew as a result of his study were that fundamental schools may be located in both small and large school districts and can be designed to serve all grade levels. The fundamental schools appear to be closely structured and maintain a carefully controlled teacher-centered learning environment. Little additional funding is required to establish a fundamental school philosophy since the existing staff, school facilities, and district resources can be utilized effectively. Finally, it was evident that fundamental schools result in a strong and supportive community.

Reports from school districts throughout the country that have implemented fundamental schools appear to confirm Bond's findings. For example, Rebecca Morgan, President of the Palo Alto, California School Board, states

in a reference to her school district's fundamental school:

> A group of previously unhappy parents proposed the structured alternative and we, the board, approved it. Upshot: A lot of parents who were dissatisfied with some of the other schools in the district, now have the type of school they want and will support enthusiastically with their tax dollars (Morgan, 1976, p. 24).

Johnson and Pearson (1979) found that parents reported choosing the three fundamental schools in the Minneapolis School System for their children because of the emphasis on reading, arithmetic, writing, discipline, self-contained classrooms, citizenship, and character development. Their survey showed the parents generally satisfied with the homework load, opportunity for involvement with the teacher, child's progress, and the communication about that progress.

Myers (1977), a basic education proponent and the integral force behind the 1973 opening of the John Marshall Fundamental School in Pasadena, California, wrote a book entitled Fundamentally Speaking, which is essentially a manual for establishing such schools. Myers states that "a Fundamental School is simply a school where basics of education are stressed with little or no experimentation, where discipline reigns and patriotism flourishes" (p. 56). He suggests the basic activities of a fundamental school be as follows: 1) emphasize instruction in reading, writing, speaking, arithmetic, and the teaching of basic science and cultural subjects; 2) specify a uniform policy for homework on all levels; 3) seek to develop efficient

study and work habits; 4) place emphasis on character building, and the teaching of moral principles and common courtesy; 5) emphasize discipline, respect for authority and partoitism; and 6) have a dress code for teachers and students.

In Myers' opinion, conventional schools are lacking in a number of areas, ranging from lack of basic instruction to poor discipline. He attributes these problems to such things as progressive school boards, militant teachers' unions, innovative curriculum, and social promotion. However, a part of our population that is growing and becoming increasingly articulate, desires a more academic and structured type of fundamental education for their children. Myers believes that the "alternative school" concept which is sweeping the nation represents the idea that, in a society such as ours, parents should have a choice as to how they want their children educated. "Most successful fundamental schools," he states, "are greatly influenced and strongly monitored by the parent group that started them" (p. 81).

Page (1977) acknowledges that Myers helped establish four back-to-basics schools while serving as chairman of the Pasadena, California School Board in the 1970's. She feels his book extols the virtues of fundamental schools with near-messianic fervor and is sure it will "keep the educational pot boiling." While Ferguson (1978) agrees with Page that Myers represents an "alarmist" position

which influences all those concerned with American education, he also views Fundamentally Speaking as an invaluable book for the enlightened educator. He feels that principals should be knowledgeable of the extreme conservative viewpoint so they can react intelligently. Ferguson states that Myers' book has the redeeming feature of providing a strong case for the right to alternative schools with voluntary enrollment. Since alternative liberal programs have been established and accepted, Ferguson believes parents have the right to call for the establishment of alternative conservative schools.

The concept of alternative schools has been in existence for many years, longer than the fundamental school movement. Alternative schools are characterized by voluntarism according to Lieberman and Griffin (1977). Their study also found the decision making involved more participation on the part of the community than in traditional schools and that alternative schools, with some limitations, can serve as a change agent. Salerno (1977), in his analysis of the development of a K-3 alternative school, concluded that the alternative school served as a complement to the neighborhood school and enabled the school district to become more responsive to parents and students. Alternative schools support the theory that different students learn in different ways according to Mazzarella (1978). These schools can be distinguished by their philosophy, sponsor, or curriculum and provide a variety of educational programs for

students.

A study of all the public alternative schools in six New England states (Barkhurst and Wolf, 1978) revealed that these schools were initiated by well-established persons who generated a broad base of community support. An interesting conclusion of the study was that alternative school officials did not rely upon established educational agencies for information. Staff serving such schools actively exchanged information about their program with others who shared the same ideas. The alternative school staffs in New England drew heavily from human resources within their communities to initiate and sustain school operations. These human resources, however, did tend to diminish in importance as the school program matured.

Smith (1973) cites the fact that there are numerous types of alternative public schools in operation and many share common characteristics. The alternative school is an option within its community, he states, and therefore does not require consensus to justify its existence. It provides a strategy for making schools more responsive to families dissatisfied with conventional schools, without imposing on the rights of those who are satisfied with the present schools.

According to Barr (1981), many alternative schools, although not characterized as back-to-basics fundamental school alternatives, have nontheless been influenced by an emphasis in cognitive proficiency. A Ford Foundation

report (1974) on alternative elementary and secondary schools, both public and nonpublic, concluded:

> Where standard measures of achievement, such as test scores and college admissions are applicable, they show that alternative school students perform at least as well as their counterparts in traditional school programs, and usually better. Attendance rates almost without exception exceed those in regular schools (p. 6).

Doob (1977) synthesized evaluation data from more than twenty-five alternative schools and found that in most cases the academic achievement of students improved or remained stable. Jennings and Nathan (1977) summed up evaluations and other research on alternative public schools as follows:

> Virtually every evaluation of these contemporary alternative schools shows students doing as well as or better than students in traditional schools, when standardized tests are the evaluation instrument. Perhaps more important, they feel much better about themselves and are confident of their ability to accomplish things for themselves. They also demonstrate more positive attitudes toward school and learning (p. 568).

An in-depth report by Barr, Colston, and Parrett (1977) examined the evaluations of six highly regarded alternative schools that had been in existence for at least three years. The study provided additional insight into some basic questions raised about alternative schools:

1. <u>How effective are alternative schools in the area of student cognitive achievement?</u>

   Each of the evaluations that measured cognitive achievement found most students to be learning at a rate consistent with or higher than the district norm. Higher grade point averages,

increased scholastic aptitude test scores, and student gain in reading and math levels characterized the findings. In short, it appears that in each of the schools that were analyzed, one could be assured that most students would achieve at least as well, if not better, than in the comprehensive school available to them.

2. How effective are alternative schools in the development of student attitudes and self concepts?

   The program evaluations consistently found the attitudes of students toward the school and themselves to be higher in the alternative setting. Students in attendance in these programs assume an increased level of interest in basic skills and overall curriculum development. Highly positive feelings toward teachers, peers, administrators, and the overall instructional philosophy also appear to be nurtured in these programs. The data provided by these reports indicates that student attitude levels increase with participation in the program.

3. How effective are the alternative schools in developing positive behavior, especially in the areas of attendance, suspensions, and school disruption?

   Each of the programs that reported attendance and enrollment data found a decreased rate of student dropout and an increased rate of school and classroom attendance. Discipline problems appear to be at a minimum, thus resulting in drastically lowered rates of suspension. One could assume that the causes of dropout problems and suspensions are lessened in these programs due to the low occurrence of these phenomena. Higher attendance rates could well be directly related to an increase in student interest and attitudes toward school (p. 27).

However, when drawing conclusions from these reports and studies, one must recognize that the oldest fundamental school is barely a decade old and long term records have yet to be firmly established. In terms of affective and cognitive evaluation, research is available on programs tied closely to the back-to-basics concept. However, studies directed

expressly at fundamental alternative schools are still limited in number.

Totdahl (1977) investigated the possible relationship between a highly structured educational program to affective and cognitive outcomes exhibited by students. A nonrandomized control group pretest-posttest design was used with children drawn from the same Head Start classrooms. The students in the structured program were compared with students in the traditional educational program. The children in the experimental group were enrolled in the highly structured program for four years (K-3) and were then followed for another two years after completing the program.

Based on the findings of the study, conclusions drawn with respect to the highly structured educational program found no significant difference between those who participated in the traditional program in level of intelligence, personal adjustment, attitude toward self and attitude toward school. However, the motivation of children to succeed in school was related to their participation in the highly structured educational program. The level of cognitive achievement measured at four points during the program showed a significant relationship to the highly structured program. The level of cognitive achievement at the end of the four year program was significantly related to the highly structured educational program as was the level of cognitive achievement one year after the conclusion of the program. Two years after the conclusion of the program, no

significant difference appeared between children in the two programs.

Instruments used for gathering data in Totdahl's study included various levels of the Metropolitan and Stanford Achievement Test, Kuhlmann-Anderson and Otis Lennon I.Q. Tests, Children's Personality Questionnaire, two levels of the School Sentiment Index, Illinois Index of Self Derogation, and the Gumpgookies Test. The probability level for all tests of statistical significance was established at .05.

A study by Warren (1976) attempted to evaluate an alternative program developed to improve basic skills of underachieving junior high school students. Underachievers enrolled in an alternative program designed to improve basic skills were compared with a group of eighth and ninth grade underachievers in the traditional program. The sample population was composed of 170 eighth and ninth grade students identitied as being underachievers by a committee of teachers, supervisors, guidance counselors, and school social workers. The subjects were randomly assigned to experimental (alternative program) and control (traditional program) groups. Instruments used for gathering data were the Piers-Harris Children's Self-Concept Scale, the Metropolitan Achievement Test (Reading and Mathematics), and official attendance books. The findings of the study showed no significant differences existed among posttest mean scores in reading and mathematics achievement of the two groups after eight months

participation in their respective programs. However, significant differences did exist among posttest scores in self-concept between students in the two programs. In addition, significant differences in attendance were found favoring students in the alternative junior high program designed to improve skills.

Irwin (1982) studied the locus of control beliefs and academic achievement between a fundamental alternative school and a regular comprehensive school in suburban Sacramento, California. His prime focus of research was to provide data useful in appraising the potential of alternative education and regular comprehensive programs for improving academic performance and influencing locus of control beliefs for intermediate level students. Mean scores were compared from sixty randomly selected students from each school on two locus of control questionnaires (the Rotter Internal-External Scale, Intellectual Achievement Responsibility), the Iowa Tests of Basic Skills, and a modified social/educational/occupational survey.

The data provided evidence that a fundamental alternative school does not promote academic achievement more than a regular comprehensive school. Moreover, the data suggested that both schools inhibited student internal locus of control beliefs and responsibility. Of note was that the least amount of internality was demonstrated by students attending the fundamental alternative school, although students who were more internal in their locus of control beliefs did

not demonstrate higher academic achievement in reading or mathematics. Irwin states that this particular finding was in contrast to past research. The association between the type of school attended and those making the decision to attend demonstrated that parental influence was much greater at the alternative fundamental school. This result was supportive of prior findings.

Spencer (1982) studied the academic achievement of students attending a fundamental alternative school in Saint Paul, Minnesota. SRA achievement test gains made by Benjamin E. Mays Fundamental School students during the 1978-79 through 1980-81 academic school years were compared with a control group of students who applied for admission and are on a waiting list while attending other schools in the Saint Paul Public School System. There were twenty-three experimental group students and thirty-three control group students involved in the study. Of these students, thirty-one were black and twenty-five were white, twenty-six were male and thirty were female. Students were compared on the basis of improvement in growth (adjusted for pretest) scores as defined by SRA from the fourth through the sixth grade in composite, reading, mathematics and language arts.

The findings of Spencer's study indicated a significant difference in the following academic areas:

1) Significant differences were favorable on behalf of the experimental group in growth on composite and language scores.

2) Significant differences in growth by sex were indicated in reading. The female students in the experimental group made larger gains than the students in the control group (p. 63).

Conclusions drawn from the analyses of the data of this study included the following:

1) It appeared that attendance at the Benjamin E. Mays Fundamental School produced no better results in mathematics than those enrolled in regular programs in the Saint Paul Schools.

2) The black and white parents who chose to enroll their children in the Benjamin E. Mays Fundamental School have reason to be pleased with the results of this study. Both female and male students in the experimental group made larger gains in both the composite score and in language arts than their counterparts in the control group.

3) The strength of the language arts program at Benjamin E. Mays Fundamental School was apparent. This was one set of growth scores that was consistantly higher for students who enrolled in this program.

4) Although statistical significance between the experimental and control groups was found only in language arts and on composite scores, the students in the experimental group made larger gains in achievement in all areas tested than their peers in the control group (pp. 69-70).

Summary

Research specifically directed to the integral facets of alternative fundamental schools is not in abundance. The limited data showed some claims of academic success but the literature did not present a clear picture on the benefits that fundamental schools claim to provide. However, many alternative educational programs have been

researched and evaluated with the results of these studies pointing to approaches that have effectively met the academic and social needs of children. Evaluations of alternative schools show that in the majority of cases, the students perform as well or better than their counterparts in regular school programs. These alternative schools should, however, be examined carefully before attempting to implement them into a public school system.

CHAPTER III

DESIGN OF THE STUDY

Introduction

This study was designed to compare the academic achievement and attitude of students in an alternative fundamental school program with students in a regular school program during the 1982-83 school year in the Saginaw Township Community School District. The students were compared on the basis of growth in scale scores on the Comprehensive Tests of Basic Skills for Total Reading, Total Language, Total Math, and Total Battery for the second and third grades. First graders took less encompassing forms of CTBS which included Total Reading. Students in both the experimental and control groups were also compared as to their attitude toward school based on the results of their scores on the School Sentiment Index.

This chapter contains the design of the study, a description of the sample, and the measuring instruments which were selected for purposes of student comparison. Also included are the testable hypotheses and the analysis procedures.

Sample

The students sampled in this study came from two public elementary schools (Arrowwood and Weiss) in Saginaw Township, Michigan. Each school contained an alternative fundamental program for grades one, two, and three as well as a regular program for first, second, and third graders.

The students in the experimental group had been placed in this school grouping on the basis of parental requests to participate in the alternative fundamental program. The control group consisted of students in the regular first, second, and third grade classrooms at each school. The students in both groups ranged from age six to nine, were by a large majority Caucasian, and represented a fairly equal distribution of males and females. There were 140 students in the experimental group and 130 students in the control group. The breakdown by grade level and sex is shown in Table 3.1.

Table 3.1

Grade Level and Sex of Students in the Experimental and Control Groups

Experimental Group

Sex	Grade 1	Grade 2	Grade 3	Total
Male	27	22	27	76
Female	23	19	22	64
Total	50	41	49	140

Control Group

Sex	Grade 1	Grade 2	Grade 3	Total
Male	23	23	18	64
Female	16	20	30	66
Total	39	43	48	130

The Saginaw Township Community School District serves an area covering thirty-six square miles and has a population of approximately 40,000 people. The school district employs 478 people which includes a teaching staff of 270 assigned to six elementary schools, two middle schools, and two high schools. Saginaw Township is largely a middle to upper middle class community and although characterized by many small businesses and industries, General Motors is recognized as a leading employer of its residents.

Measures

Historically, students in the district have been tested in the cognitive domain. For many years Saginaw Township has conducted a district-wide testing program using a nationally standardized academic achievement test, the Comprehensive Tests of Basic Skills (CTBS). This test measured students in the second and third grades in Total Reading, Total Language, Total Math, and Total Battery. First graders were given a less comprehensive level of the test which provided scores for Total Reading. All students were given the School Sentiment Index to measure their attitude toward school.

The Comprehensive Tests of Basic Skills (Form U) is a series of norm-referenced, objective based tests for kindergarten through twelfth grade. The series is designed to measure achievement in the basic skills commonly found in state and district curricula. To identify the educational

objectives that would be measured, comprehensive reviews have been made of state and district curriculum guides, textbook series, and instructional programs. Because the tests combine the most useful characteristics of norm-referenced and criterion-referenced tests, they provide information about the relative ranking of students against a norm group as well as specific information about the instructional needs of the students. The sampling procedures for CTBS were designed to provide both Fall and Spring norms based on a sample of the entire United States school population. The norming sample contained approximately 250,000 students from public, Catholic, and other private schools. This sampling took place in the fall of 1980 and the spring of 1981.

The scale score is the basic score for CTBS and is used primarily to provide a basis for deriving various other normative scores to describe test performance. Scale scores are units of a single, equal interval scale that is applied across all levels of CTBS. Since scores are expressed in numbers that can range from 0 through 999, the equal interval property of scale scores makes them appropriate for statistical purposes.

The School Sentiment Index is an inventory device developed for the purpose of securing a child's responses to questions which pertain to his/her attitude toward school. Its development began in 1970 when representatives of Title III programs in four states gathered in Washington, D.C. to

discuss objectives and measuring devices which might be used for educational needs assessments and evaluations, particularly in the affective domain. The Title III representatives decided at this time to pool certain of their financial resources and cooperatively support a development project by the Instructional Objectives Exchange. The Instructional Objectives Exchange (IOX) had been established several years earlier in 1968 by the UCLA Center for Evaluation.

The Instructional Objectives Exchange's assignment was to produce objectives or measures which could be employed for educational needs assessments and educational evaluation in specific affective areas, the most important being the learner's attitude toward school. IOX members undertook a search of literature relevant to the topics of attitudes toward school. They found considerable literature on variables which may have impact upon attitudes per se. The IOX also consulted a number of educators familiar with sociological and attitudinal concomitants of school attendance and with attitude measurement techniques. After this preliminary, the IOX staff began to produce items which, in a rather direct fashion, solicited the learner's feelings regarding the school environment. The emerging instrument ultimately included five dimensions of attitude toward school: teachers, school subjects, social structure and climate, peers, and general (Instructional Objectives Exchange, 1972).

As used in this study, the School Sentiment Index

consists of thirty-five questions regarding various aspects of school. Students responded to each question by answering yes or no. An overall score for the entire measure, reflective of student attitude toward school in general was obtained. The rationale underlying this measure is that the more frequently students answer yes to questions reflecting positive aspects of school attitude dimensions and no to questions reflecting negative aspects of such dimensions, the more positive the students' attitudes toward school.

Validity of the Measuring Instruments

Validity concerns the issue of whether or not a test is actually measuring what it is supposed to be measuring. There are several types of validity, however the one greatest concern of educators is content validity. Content validity depends to a large extent on whether or not the items in a test accurately represent the subject matter that the test was designed to cover.

During the development of CTBS, form U, the definition and refinement of content specifications were continous processes. After the initial curricular reviews, content coverage was verified as part of the procedures for development of items, analysis of tryout data, and selection of final test items. The procedures were designed to ensure the stimulus materials and items met the content criteria established for the tests, were well constructed, and were written in language appropriate for the various levels of

testing. All test items were edited according to recognized principles of test construction. CTB/McGraw-Hill editorial staff chose content validity as its first criterion and applied several methods to ensure the accuracy, currentness, and curricular relevance of the materials developed for CTBS. The appropriateness of test content for various groups is also an important aspect of test development. Stringent editorial procedures were applied to CTBS so that careful attention was given to questions of ethnic, racial, age, and gender bias (CTB/McGraw-Hill, 1983).

On the School Sentiment Index, the accuracy with which scores on these measures would yield valid estimates of one's attitude toward school was subjected to considerable scrutiny throughout the various stages of development. Not only were measures tried out on students, but the validity of the general rationale, and the scoring of particular individual items, were constantly checked with members of the IOX staff as well as external consultants. Items were screened, re-worked, and tried on various groups of learners. Upon the initial release, the attitude toward school materials were well received by educators throughout the nation. However, it was apparent to the IOX staff that improvements in the measures would have to be undertaken using a larger and more representative student population.

The measures were revised in 1972 to improve both their reliability and validity. The revision of the School Sentiment Index resulted in a more refined measure that was

more defensibly based on field test data from a more representative learner population (Instructional Objectives Exchange, p. 7).

Reliability of the Measuring Instruments

Reliability is the consistency of test results. Reliable tests produce scores that are dependable and stable. When tests are used repeatedly in similar situations, they can be expected to produce similar results. Usually the methods for estimating the reliability of tests utilize a correlation coefficient which indicates the degree of reliability. A perfect reliability would be 1.00 while 0.00 would indicate no reliability. Test reliabilities that exceed .80 are considered excellent. A frequently used measure of internal consistency, the Kuder-Richardson formula 20 (KR 20), was applied to CTBS, form U. In the CTB/McGraw-Hill Technical Report (1983) the authors present reliability coefficients for the test. The reliability coefficients are shown in Table 3.2.

Table 3.2

Average KR-20 Reliabilities

For Comprehensive Tests of

Basic Skills (1981 ed.)

Test	Level B	Level C	Level D	Level E
Total Reading	.88	.95	.95	.96
Total Language			.91	.91
Total Math			.91	.94
Total Battery			.97	.98

The revised School Sentiment Index was subjected to the Kuder-Richardson 20 analysis for an internal consistency estimate. Similarly, a test-retest correlation was computed. Results of these analyses on the School Sentiment Index were .72 for internal consistency and .87 for test-retest stability.

Design

The design of this study was formulated after consulting Michigan State University staff as well as authorities in the public sector. The research methodology used to evaluate academic achievement was the non-equivalent control group pretest-posttest design (Campbell & Stanley, 1966). A 2x2x3 design was utilized for analysis of Total Reading

and attitude toward school scores. A 2x2x2 design was utilized for evaluating Total Language, Total Mathematics, and Total Battery. This enabled the comparison of male and female students in the fundamental and regular classrooms at the first and/or second and third grade levels.

Testable Hypotheses

The following research questions and the hypotheses they generate will be tested in this study.

Research Question 1: Will there be a difference in the academic achievement of students in the fundamental school program as compared to students in the regular school program?

Research Question 2: Will there be a difference in the attitude toward school of students in the fundamental school program as compared to students in the regular school program?

Research Question 3: Will there be significant interactions by grade level, by sex, or between grade level and sex in the academic achievement of students in the fundamental school program as compared to students in the regular school program?

Research Question 4: Will there be significant interactions by grade level, by sex, or between grade level and sex in the attitude toward school of students in the fundamental school program as compared to students in the regular school program?

The research objectives were equated within the design of the study to statements in terms of the null hypotheses.

Null Hypothesis 1: There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on mean total battery performance increase.

Null Hypothesis 2: There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on mean total reading performance increase.

Null Hypothesis 3: There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on mean total language performance increase.

Null Hypothesis 4: There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on mean total mathematics performance increase.

Null Hypothesis 5: There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on attitude toward school mean scores.

Null Hypothesis 6: There is no significant interaction ($p < .05$) between program and grade level on mean total battery performance increase.

Null Hypothesis 7: There is no significant interaction ($p < .05$) between program and grade level on mean total reading performance increase.

Null Hypothesis 8: There is no significant interaction ($p < .05$) between program and grade level on mean total language performance increase.

Null Hypothesis 9: There is no significant interaction ($p < .05$) between program and grade level on mean total mathematics performance increase.

Null Hypothesis 10: There is no significant interaction ($p < .05$) between program and grade level on attitude toward school mean scores.

Null Hypothesis 11: There is no significant interaction ($p < .05$) between program and sex on mean total battery performance increase.

Null Hypothesis 12: There is no significant interaction ($p < .05$) between program and sex on mean total reading performance increase.

Null Hypothesis 13: There is no significant interaction ($p < .05$) between program and sex on mean total language performance increase.

Null Hypothesis 14: There is no significant interaction ($p < .05$) between program and sex on total mathematics performance increase.

Null Hypothesis 15: There is no significant interaction ($p < .05$) between program and sex on attitude toward school mean scores.

Null Hypothesis 16: There is no significant interaction ($p < .05$) between program, grade level, and sex on mean total battery performance increase.

Null Hypothesis 17: There is no significant interaction ($p < .05$) between program, grade level, and sex on mean total reading performance increase.

Null Hypothesis 18: There is no significant interaction ($p < .05$) between program, grade level, and sex on mean total language performance increase.

Null Hypothesis 19: There is no significant interaction ($p < .05$) between program, grade level, and sex on mean total mathematics performance increase.

Null Hypothesis 20: There is no significant interaction ($p < .05$) between program, grade level, and sex on attitude toward school mean scores.

Analysis

The three-way analysis of co-variance procedure was used for the inferential testing of all null hypotheses pertaining to academic achievement in this study. The appropriateness of this model was determined by the fact that

subjects in the experimental and control groups were not selected randomly and therefore initial differences may exist between them on CTBS pretest results.

The attitude survey was given as a posttest based upon the assumption that attitude is not necessarily incremental and that evaluation of student attitude after being exposed to the program was appropriate. Furthermore, analysis of the attitude pretest did not show significant differences between the experimental and control groups. The results were analyzed by analysis of variance.

The probability for rejecting the results of the individual null hypotheses was established at the .05 level of significance. The computer program used for analyzing the data was the Statistical Package for Social Sciences (SPSS).

Summary

In this chapter information was presented regarding the subjects used in the study, the instruments used for measurement, the design, and analysis.

The subjects were students in the fundamental and regular school programs in the Saginaw Township Community School System for grades one, two, and three. They were evaluated using the Comprehensive Tests of Basic Skills (Levels B, C, D, E) for academic achievement and the School Sentiment Index for attitude toward school. The three-way

analysis of co-variance was used to determine the relationship of program, grade level, and sex for academic achievement. The analysis of variance was used to evaluate the attitude toward school of the subjects. A probability level of .05 was set for the inferential testing of all null hypotheses in the study.

CHAPTER IV

ANALYSIS OF RESULTS

Introduction

The researcher's purpose in this study was to compare students in a fundamental school program with students in a regular school program in the Saginaw Township Community School System. Using established instruments, the investigator compared students in academic achievement growth and attitude toward school after exposure to the program during the 1982-83 school year.

A three-way analysis of co-variance procedure was used for inferential testing of academic achievement across the population groups in the study. The analysis of variance procedure was used to compare attitude toward school of the students after exposure to the program. Narrative presentations are included for the hypotheses stated broadly in Chapter I and further discussed in more specific form in Chapter III. The probability level for all tests of statistical significance between groups receiving the fundamental and regular school programs was established at .05.

In the areas of the data where the ANCOVA or ANOVA indicated significant F values relevant to the null hypotheses, post hoc comparisons were applied in the form of t-tests for independent means on mean scale score performance increase (posttest score minus pretest score) of students in the two programs for academic achievement. In addition, the t-test

for independent means was used for post hoc comparison of attitude toward school scores for the experimental and control groups. Null hypotheses were rejected only if statistically significant mean differences were established on the t-tests.

Table 4.1 lists "F" statistics for each hypothesis tested and Table 4.2 lists "t" values for each hypothesis included in post hoc comparisons. Mean scale score performance increases for each program by sex and grade level are found in Tables 4.3 through 4.14. Tables 4.15 through 4.17 list mean scores for attitude toward school by program, sex, and grade level.

Hypotheses

Null Hypothesis One

Null Hypothesis One stated:

> There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on mean total battery performance increase.

To test this hypothesis, data were collected on CTBS levels D and E for second and third graders. No statistically significant difference was found between the students in the fundamental school program and students in the regular school program on mean total battery performance increase. Therefore, the null hypothesis could not be rejected.

Table 4.1

"F" Statistics Associated with Research Hypotheses

Hypotheses	Total Battery	Total Reading	Total Language	Total Math	Attitude
1	9.981**				
2		16.557**			
3			7.364**		
4				8.799**	
5					20.895
6	2.121				
7		3.229*			
8			0.013		
9				1.420	
10					2.083
11	1.294				
12		0.009			
13			0.089		
14				0.191	
15					4.289*
16	1.066				
17		1.769			
18			0.199		
19				0.083	
20					0.859

*significant at the .05 level

**significant at the .01 level

Table 4.2

"t" Values Associated with Research Hypotheses

Hypotheses	Total Battery	Total Reading	Total Language	Total Math	Attitude
1	-0.20				
2		0.93			
3			0.66		
4				0.19	
5					4.19**
7		Grade One 2.05*			
		Grade Two -0.28			
		Grade Three -1.62			
15				Males	4.09**
				Females	2.05

*significant at the .05 level

**significant at the .01 level

Two-tailed t-tests were applied as the null hypotheses did not predict a direction. In all cases, the regular school mean was subtracted from the fundamental school mean.

Null Hypothesis Two

Null Hypothesis Two stated:

> There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on mean total reading performance increase.

To test this hypothesis, data were collected on CTBS levels B, C, D, and E for first, second, and third graders. The statistical analysis found no significant difference between the students in the fundamental school program and students in the regular school program on mean total reading performance increase. As a result, the null hypothesis could not be rejected.

Null Hypothesis Three

Null Hypothesis Three stated:

> There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on mean total language performance increase.

To test this hypothesis, data were collected on CTBS levels D and E for second and third graders. No statistically significant difference was found between the students in the fundamental school program and students in the regular school program on mean total language performance increase. Thus, the null hypothesis could not be rejected.

Null Hypothesis Four

Null Hypothesis Four stated:

> There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on mean total mathematics performance increase.

To test this hypothesis, data were collected on CTBS levels D and E for second and third graders. Statistical results of the analysis showed no significant difference between the students in the fundamental school program and students in the regular school program on mean total mathematics performance increase. The null hypothesis could not be rejected.

Null Hypothesis Five

Null Hypothesis Five stated:

> There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on attitude toward school mean scores.

To test this hypothesis, data were collected on the primary level of the School Sentiment Index for first, second, and third graders. As Table 4.2 indicates, a statistically significant difference was found between the students in the fundamental school program and students in the regular school programs on attitude twoard school mean scores. The null hypothesis was therefore rejected at the .01 level.

Null Hypothesis Six

Null Hypothesis Six stated:

> There is no significant interaction ($p < .05$) between program and grade level on mean total battery performance increase.

To test this hypothesis, data were collected on CTBS levels D and E, for second and third graders. No statistically significant interaction was found between students in

the fundamental school program and students in the regular school program on mean total battery performance increase by grade level. Therefore, the null hypothesis could not be rejected.

Null Hypothesis Seven

Null Hypothesis Seven stated:

> There is no significant interaction ($p < .05$) between program and grade level on mean total reading performance increase.

To test this hypothesis, data were collected on CTBS levels B, C, D, and E for first, second, and third graders. The results of the analysis reported in Table 4.2 indicate a statistically significant interaction did exist between program and grade level. Fundamental school students at the first grade level scored significantly higher statistically than their regular school counterparts on mean total reading performance increase. The null hypothesis was therefore rejected at the .05 level.

Null Hypothesis Eight

Null Hypothesis Eight stated:

> There is no significant interaction ($p < .05$) between program and grade level on mean total language performance increase.

To test this hypothesis, data were collected on CTBS levels D and E for second and third graders. The statistical analysis found no significant interaction between the students in the fundamental school program and students in

the regular school program on mean total language performance increase by grade level. As a result, the null hypothesis could not be rejected.

Null Hypothesis Nine

Null Hypothesis Nine stated:

> There is no significant interaction ($p < .05$) between program and grade level on mean total mathematics performance increase.

To test this hypothesis, data were collected on CTBS levels D and E for second and third graders. No statistically significant interaction was found between students in the fundamental school program and students in the regular school program on mean total mathematics performance increase by grade level. Consequently, the null hypothesis could not be rejected.

Null Hypothesis Ten

Null Hypothesis Ten stated:

> There is no significant interaction ($p < .05$) between program and grade level on attitude toward school mean scores.

To test this hypothesis, data were collected on the primary level of the School Sentiment Index for first, second, and third graders. Statistical results of the analysis showed no significant interaction between students in the fundamental school program and students in the regular school program on attitude toward school mean scores by grade level. Thus, the null hypothesis could not be rejected.

Null Hypothesis Eleven

Null Hypothesis Eleven stated:

> There is no significant interaction ($p < .05$) between program and sex on mean total battery performance increase.

To test this hypothesis, data were collected on CTBS levels D and E for second and third graders. No statistically significant interaction was found between students in the fundamental school program and students in the regular school program on mean total battery performance increase by sex. The null hypothesis could not be rejected.

Null Hypothesis Twelve

Null Hypothesis Twelve stated:

> There is no significant interaction ($p < .05$) between program and sex on mean total reading performance increase.

To test this hypothesis, data were collected on CTBS levels B, C, D, and E for first, second, and third graders. The statistical analysis found no significant interaction between students in the fundamental school program and students in the regular school program on mean total reading performance increase by sex. As a result, the null hypothesis could not be rejected.

Null Hypothesis Thirteen

Null Hypothesis Thirteen stated:

> There is no significant interaction ($p < .05$) between program and sex on mean total language performance increase.

To test this hypothesis, data were collected on CTBS

levels D and E for second and third graders. No statistically significant interaction was found between students in the fundamental school program and students in the regular school program on mean total language performance increase by sex. Therefore, the null hypothesis could not be rejected.

Null Hypothesis Fourteen

Null Hypothesis Fourteen stated:

> There is no significant interaction ($p < .05$) between program and sex on mean total mathematics performance increase.

To test this hypothesis, data were collected on CTBS levels D and E for second and third graders. Statistical results of the analysis showed no significant interaction between students in the fundamental school program and students in the regular school program on mean total mathematics performance increase by sex. Consequently, the null hypothesis could not be rejected.

Null Hypothesis Fifteen

Null Hypothesis Fifteen stated:

> There is no significant interaction ($p < .05$) between program and sex on attitude toward school mean scores.

To test this hypothesis, data were collected on the primary level of the School Sentiment Index for first, second, and third graders. As Table 4.2 indicates, a statistically significant interaction was found between students in the fundamental school program and students in the regular school program on attitude toward school mean scores

by sex. The null hypothesis was therefore rejected at the .05 level for females and the .01 level for males.

Null Hypothesis Sixteen

Null Hypothesis Sixteen stated:

> There is no significant interaction ($p < .05$) between program, grade level, and sex on mean total battery performance increase.

To test this hypothesis, data were collected on CTBS levels D and E for second and third graders. No statistically significant interaction was found between students in the fundamental school program and students in the regular school program on mean total battery performance increase by grade level and sex. Thus, the null hypothesis could not be rejected.

Null Hypothesis Seventeen

Null Hypothesis Seventeen stated:

> There is no significant interaction ($p < .05$) between prpgram, grade level, and sex on mean total reading performance increase.

To test this hypothesis, data were collected on CTBS levels B, C, D, and E for first, second, and third graders. The statistical analysis found no significant interaction between students in the fundamental school program and students in the regular school program on mean total reading performance increase by grade level and sex. The null hypothesis could not be rejected.

Null Hypothesis Eighteen

Null Hypothesis Eighteen stated:

> There is no significant interaction ($p < .05$) between program, grade level, and sex on mean total language performance increase.

To test this hypothesis, data were collected on CTBS levels D and E for second and third graders. No statistically significant interaction was found between students in the fundamental school program and students in the regular school program on mean total language performance increase by grade level and sex. As a result, the null hypothesis could not be rejected.

Null Hypothesis Nineteen

Null Hypothesis Nineteen stated:

> There is no significant interaction ($p < .05$) between program, grade level, and sex on mean total mathematics performance increase.

To test this hypothesis, data were collected on CTBS levels D and E for second and third graders. Statistical analysis did not reveal a significant interaction between students in the fundamental school program and students in the regular school program on mean total mathematics performance increase by grade level and sex. Consequently, the null hypothesis could not be rejected.

Null Hypothesis Twenty

Null Hypothesis Twenty stated:

> There is no significant interaction ($p < .05$) between program, grade level, and sex on attitude toward school mean scores.

To test this hypothesis, data were collected on the primary level of the School Sentiment Index for first, second, and third graders. No statistically significant interaction was found between students in the fundamental school program and students in the regular school program on attitude toward school mean scores by grade level and sex. Therefore, the null hypothesis could not be rejected.

Summary

The analyses of the data indicated some significant findings in specific areas of academic achievement and attitude toward school. Students in the fundamental school program, for example, performed significantly higher than regular school students on attitude toward school mean scores (null hypothesis five).

A significant interaction was found in the comparison of mean total reading performance increase by program and grade level. Fundamental school students performed significantly higher at the first grade level than regular school students (null hypothesis seven).

The test of null hypothesis fifteen indicated that the findings were favorable on behalf of the students in the

fundamental school program. Both female and male students in the experimental group performed significantly higher than their counterparts in the regular school program on attitude toward school mean scores.

Table 4.3

Mean Scale Score Performance Increase: Total Battery

Male x Program x Grade Level

	Grade Two	Grade Three	Total
Experimental	80.91	57.22	67.86
Control	84.87	61.72	74.71
Total	82.94	59.02	70.98

Table 4.4

Mean Scale Score Performance Increase: Total Battery

Female x Program x Grade Level

	Grade Two	Grade Three	Total
Experimental	79.48	45.09	61.02
Control	70.50	50.50	58.05
Total	74.87	48.21	59.64

Table 4.5

Mean Scale Score Performance Increase: Total Battery

Program x Grade Level

	Grade Two	Grade Three	Total
Experimental	80.25	51.78	64.75
Control	78.18	54.71	65.80
Total	79.19	53.23	65.28

Table 4.6

Mean Scale Score Performance Increase: Total Reading

Male x Program x Grade Level

	Grade One	Grade Two	Grade Three	Total
Experimental	174.93	86.00	46.12	104.44
Control	156.21	95.13	56.72	106.28
Total	166.32	90.78	50.46	105.29

Table 4.7

Mean Scale Score Performance Increase: Total Reading

Female x Program x Grade Level

	Grade One	Grade Two	Grade Three	Total
Experimental	184.25	69.95	37.00	96.45
Control	151.43	66.20	50.67	79.80
Total	169.66	68.03	44.96	87.73

Table 4.8

Mean Scale Score Performance Increase: Total Reading

Program x Grade Level

	Grade One	Grade Two	Grade Three	Total
Experimental	178.90	78.38	41.96	100.86
Control	154.26	81.67	52.94	92.84
Total	167.72	80.09	47.50	96.90

Table 4.9

Mean Scale Score Performance Increase: Total Language

Male x Program x Grade Level

	Grade Two	Grade Three	Total
Experimental	65.52	63.08	64.30
Control	71.43	60.67	66.71
Total	68.69	62.11	65.40

Table 4.10

Mean Scale Score Performance Increase: Total Language

Female x Program x Grade Level

	Grade Two	Grade Three	Total
Experimental	64.21	50.36	56.78
Control	49.56	45.93	47.38
Total	56.69	47.81	51.62

Table 4.11

Mean Scale Score Performance Increase: Total Language

Program x Grade Level

	Grade Two	Grade Three	Total
Experimental	65.07	57.37	60.88
Control	61.25	51.45	56.09
Total	63.12	54.44	58.47

Table 4.12

Mean Scale Score Performance Increase: Total Mathematics

Male x Program x Grade Level

	Grade Two	Grade Three	Total
Experimental	95.78	65.00	78.81
Control	91.26	68.33	81.20
Total	93.47	66.33	79.90

Table 4.13

Mean Scale Score Performance Increase: Total Mathematics

Female x Program x Grade Level

	Grade Two	Grade Three	Total
Experimental	104.79	50.05	75.41
Control	98.90	53.50	71.66
Total	101.77	52.04	73.35

Table 4.14

Mean Scale Score Performance Increase: Total Mathematics

Program x Grade Level

	Grade Two	Grade Three	Total
Experimental	99.96	58.28	77.27
Control	94.81	59.06	75.96
Total	97.32	58.67	76.61

Table 4.15

Mean Scores: Attitude Toward School

Male x Program x Grade Level

	Grade One	Grade Two	Grade Three	Total
Experimental	29.26	28.77	24.70	27.50
Control	21.39	23.83	22.78	22.66
Total	25.64	26.24	23.93	25.29

Table 4.16

Mean Scores: Attitude Toward School

Female x Program x Grade Level

	Grade One	Grade Two	Grade Three	Total
Experimental	29.74	29.68	27.73	29.03
Control	27.06	28.55	26.37	27.20
Total	28.64	29.10	26.94	28.10

Table 4.17

Mean Scores: Attitude Toward School

Program x Grade Level

	Grade One	Grade Two	Grade Three	Total
Experimental	29.48	29.20	26.06	28.20
Control	23.72	26.02	25.02	24.96
Total	26.96	27.57	25.55	26.64

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS, AND IMPLICATIONS

Introduction

In this final chapter information regarding the summary of the study, findings, conclusions, and implications drawn from the results of the study are presented. The summary includes background information, rationale, and the design employed in the study. In the second section of this chapter, conclusions based on the findings are presented, as well as discussion relating these conclusions to the theory formulated early in the study. The chapter concludes with a discussion of the implications of the findings and recommendations for further research.

Summary

The 1970's were marked by the alternative school movement, developed as a response to the educational concerns of individual communities. Clearly, alternative schools provide parents with a choice as to how they want their children educated. At the conservative end of this movement grew the alternative fundamental public school. The political success of fundamental schools is evident, as they have continued to exist and expand over the last decade. There appears to be support for the educational philosophy fundamental schools represent, that being a stress on basic

education with little or no experimentation. Discipline, homework, character building, and emphasized instruction in reading, writing, and arithmetic are earmarks of the program.

The rapid growth of alternative fundamental schools gives rise to the concern that a philosophical basis is often used as a criteria for their implementation. Despite the impact of the back-to-basics movement and the growth of fundamental schools, there are relatively few studies available in regard to the attitude and academic achievement of students who have been exposed to this educational alternative.

The researcher's purpose in this study was to assess the academic achievement and attitudes exhibited by students in the alternative fundamental school program in the Saginaw Township Community School System during the academic school year of 1982-83. To guide the investigation, the following questions were formulated and answers to them were sought:

1. Will there be a difference in the academic achievement of students in the fundamental school program as compared to students in the regular school program?
2. Will there be a difference in the attitude toward school of students in the fundamental school program as compared to students in the regular school program?
3. Will there be significant interactions between program and grade level, between program and sex, or between program, grade level, and sex, in the academic achievement of students?

4. Will there be significant interactions between program and grade level, between program and sex, or between program, grade level, and sex, in the attitude toward school of students?

The students sampled in this study came from two elementary schools in Saginaw Township. Each school contained an alternative fundamental program for first, second, and third graders as well as a regular school program for these grade levels. The experimental group consisted of those participating in the fundamental program and the control group was drawn from students in the regular program.

The research methodology used in this study for testing academic achievement was a non-equivalent control group pre-test-posttest design of the following type:

	1 (pre)		2 (post)
Experimental Group	0	X	0
Control Group	0		0

The instruments chosen for gathering data included various levels of the Comprehensive Tests of Basic Skills for measuring academic achievement and the primary level of the School Sentiment Index for evaluating attitude toward school.

The three-way analysis of co-variance procedure was used for the initial inferential testing of the hypotheses pertaining to academic achievement. The analysis of variance was performed on data obtained from the School Sentiment

Index to test hypotheses pertaining to attitude toward school after exposure to the program. Post hoc comparisons in the form of t-test analyses for the independent means of academic scale score gains and attitude scores between the two groups were performed to identify significant findings pertaining to the null hypotheses. The probability level for all tests of statistical significance was established at .05.

Considerable care was applied to verify data accuracy and in conducting the statistical analyses. The level of significance determined by the analysis of co-variance procedure did not always correlate with significance levels established by the t-tests for independent means of scale score performance increases between the two groups. One can only make conjectures concerning these differences. Possibly the different scale score ranges on the various levels of the Comprehensive Tests of Basic Skills contributed to the significant F values on the analyses of co-variance but did not result in significant mean differences on the t-tests.

Findings of the Study

Analyses of data collected on the Comprehensive Tests of Basic Skills and the School Sentiment Index produced the following results:

Null Hypothesis 1: There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on mean total battery performance increase.

Finding: No statistically significant difference was found between fundamental school students and regular school students on mean total battery performance increase.

Null Hypothesis 2: There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on mean total reading performance increase.

Finding: No statistically significant difference was found between the fundamental school students and the regular school students on mean total reading performance increase.

Null Hypothesis 3: There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on mean total language performance increase.

Finding: No statistically significant difference was found between the fundamental school students and the regular school students on mean total language performance increase.

Null Hypothesis 4: There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on mean total mathematics performance increase.

Finding: No statistically significant difference was found between the fundamental school students and the regular school students on mean total mathematics performance increase.

Null Hypothesis 5: There is no significant difference ($p < .05$) between the fundamental school students and the regular school students on attitude toward school mean scores.

Finding: There was a statistically significant difference on attitude toward school mean scores. Student attitude toward school was significantly related to participation in the fundamental school program.

Null Hypothesis 6: There is no significant interaction ($p < .05$) between program and grade level on mean total battery performance increase.

Finding: No statistically significant interaction was found between program and grade level on mean total battery performance increase.

Null Hypothesis 7: There is no significant interaction ($p < .05$) between program and grade level on mean total reading performance increase.

Finding: There was a statistically significant interaction on mean total reading performance increase between program and grade level. At the first grade level, fundamental school students made significantly greater gains compared to the regular school students.

Null Hypothesis 8: There is no significant interaction ($p < .05$) between program and grade level on mean total language performance increase.

Finding: No statistically significant interaction was found between program and grade level on mean total language performance increase.

Null Hypothesis 9: There is no significant interaction ($p < .05$) between program and grade level on mean total mathematics performance increase.

Finding: No statistically significant interaction was found between program and grade level on mean total mathematics performance increase.

Null Hypothesis 10: There is no significant interaction ($p < .05$) between program and grade level on attitude toward school mean scores.

Finding: No statistically significant interaction was found between program and grade level on attitude toward school mean scores.

Null Hypothesis 11: There is no significant interaction ($p < .05$) between program and sex on mean total battery performance increase.

Finding: No statistically significant interaction was found between program and sex on mean total battery performance increase.

Null Hypothesis 12: There is no significant interaction ($p < .05$) between program and sex on mean total reading performance increase.

Finding: No statistically significant interaction was found between program and sex on mean total reading performance increase.

Null Hypothesis 13: There is no significant interaction ($p < .05$) between program and sex on mean total language performance increase.

Finding: No statistically significant interaction was found between program and sex on mean total language performance increase.

Null Hypothesis 14: There is no significant interaction ($p < .05$) between program and sex on mean total mathematics performance increase.

Finding: No statistically significant interaction was found between program and sex on mean total mathematics performance increase.

Null Hypothesis 15: There is no significant interaction ($p < .05$) between program and sex on attitude toward school mean scores.

Finding: There was a statistically significant interaction between program and sex on attitude toward school mean scores. Males in the fundamental school program scored significantly higher than males in the regular school program and female students in the fundamental school program scored significantly higher than female students in the regular school program.

Null Hypothesis 16: There is no significant interaction ($p < .05$) between program, grade level, and sex on mean total battery performance increase.

Finding: No statistically significant interaction was found between program, grade level, and sex on mean total battery performance increase.

Null Hypothesis 17: There is no significant interaction ($p < .05$) between program, grade level, and sex on mean total reading performance increase.

Finding: No statistically significant interaction was found between program, grade level, and sex on mean total reading performance increase.

Null Hypothesis 18: There is no significant interaction ($p < .05$) between program, grade level, and sex on mean total language performance increase.

Finding: No statistically significant interaction was found between program, grade level, and sex on mean total language performance increase.

Null Hypothesis 19: There is no significant interaction ($p < .05$) between program, grade level, and sex on mean total mathematics performance increase.

Finding: No statistically significant interaction was found between program, grade level, and sex on mean total mathematics performance increase.

Null Hypothesis 20: There is no significant interaction ($p < .05$) between program, grade level, and sex on attitude toward school mean scores.

Finding: No statistically significant interaction was found between program, grade level, and sex on attitude toward school mean scores.

Conclusions of the Study

Based on the findings of this study, the following conclusions were drawn with respect to participation in the alternative fundamental school program:

1. Mean performance increase in academic achievement for the subtest areas of Total Battery, Total Reading, Total Language, and Total Mathematics was not related to student participation in either the alternative fundamental school program or in the regular school program.
2. Although fundamental school students as a group did not perform at a statistically significant higher level on mean total reading performance increase when compared to their regular school counterparts,

a significant interaction was found between program and grade level. Fundamental school students at the first grade level performed at a statistically significant higher level than first grade students in the regular school program.

3. The attitude toward school expressed by children on the School Sentiment Index at the end of their participation in the alternative fundamental school program was significantly higher than that expressed by regular school students.
4. Both males and females in the alternative fundamental school program expressed a statistically significant higher attitude toward school as compared to their counterparts in the regular school program.

The conclusions developed from this study are limited to the population from which the samples were drawn. The abstract nature of the concept "attitude toward school" further restricts the results. Self report instruments such as the School Sentiment Index measure reported perceptions rather than observed behavior, thus requiring cautious interpretation. It is also important to note that the degree to which the reader accepts the assumptions underlying the tested theory and the statistical procedures used to test the theory constrains the generalizability of the study.

Implications of the Study

The following implications are warranted based on the data accumulated and analyzed in this study:

1. Given the fact that fundamental schools are becoming more popular throughout the country, it is important that educators become more familiar with outcomes of the limited studies that address cognitive and affective outcomes of student performance in such programs. The results of this study are in line with most past research regarding alternative schools in that the fundamental school students generally performed as well as or better than students in the regular school program as determined by statistical analysis.
2. Some educators recommend highly structured educational programs such as that offered in the alternative fundamental school for the purpose of improving the declining academic performance often reported on standardized achievement tests. The results of this study indicate some relationships between fundamental school program participation and academic achievement. However, proponents must temper their optimism as the mean performance increase of raw scale scores by program, grade level, and sex did not consistantly favor fundamental school students on the academic sub-tests.

3. The affective domain and its relationship to academic success has received increased attention during the last decade. Educators who favor structured learning environments should be encouraged with the results of this study. On the measure used, students in the alternative fundamental school program expressed a more positive attitude toward school compared to students in the regular school program. However, it is important that additional investigation be done in this area as only one measure was administered to students after program exposure.
4. Although no measurement or evaluation was conducted regarding the impact of parental involvement in the fundamental program, it is a noteworthy issue to address. Fundamental school parents signed contracts expressing their support of the philosophy of the program. It is possible that the more positive attitude displayed by fundamental school students could be attributed in part to this relationship between parents and the fundamental philosophy as well as their support for the teachers and curriculum. It is also conceivable that these parents might reflect a more supportive value system in their homes in regard to the importance of good study skills and a responsible effort.

5. Even though the curriculum materials used by students in both programs was similar, the organization of the school day in the fundamental classroom may have indirectly affected both the attitude and academic achievement of the students. Time on tasks and transition time were given high emphasis in the fundamental school.
6. Should community demand for this Fundamental School alternative remain in Saginaw Township, data exists that students in the program generally do as well as regular school students and therefore the program should be considered for continuation and/or expansion. However, neither program showed consistant superiority. This is not inconsistant with many studies that show little difference between the performance gains of students in two educational programs.

Recommendations for Further Research

Further researchers should consider improvements in methodology when gathering information using similar instruments and answering similar questions. These recommendations include:

1. An attempt should be made to secure student samples randomly selected from a larger pool of fundamental and regular school students.
2. A careful investigation of the difference in the instructional conditions of the two programs would help isolate reasons for student academic performance and attitude at all levels. Apart from the instruments used in the study, there would seem to be an additional need for evaluating those elements of school curriculum that pertain to students' attitudes and value systems.
3. A study investigating the effect of long term participation in an alternative fundamental school program should be conducted to determine the impact of extended exposure to this educational environment.
4. The affective variable should be investigated by more than one written questionnaire and at different points during extended exposure to a fundamental school program.

5. It could be of importance to other school systems considering a fundamental school program to evaluate the relationship between parental support of the program, as evidenced by their signing a support contract, and its effect on student attitude toward school.
6. At the present time, most teachers who staff regular and fundamental school programs are prepared in similar fashion. It would be of interest to study the implications of preparing teachers who teach in alternative fundamental schools in a different manner.
7. A study investigating the criteria parents use in placing their child in an alternative fundamental school program as opposed to other options would be appropriate.
8. It would be of interest to study the relationships between students' learning styles and their academic performance in the fundamental classroom.

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APPENDICES

APPENDIX A

LETTER OF APPROVAL

SAGINAW TOWNSHIP COMMUNITY SCHOOLS

3465 N. CENTER ROAD P.O. BOX 6278 SAGINAW, MICHIGAN 48608 A.C. (517) 792-8771

GERALD S. DEGROW, ED.D.

SUPERINTENDENT OF SCHOOLS

MEMORANDUM

Date: August 17, 1982

To: Richard P. Dyer

From: Gerald S. DeGrow, Superintentendent

Re: Fundamental School Research Proposal

In regard to our previous discussions concerning evaluation of the Saginaw Township Community School's Fundamental Program, I am pleased to give my permission and support for such a study. Of special interest to our district is the academic achievement of students in the program during the initial year. An investigation of student's attitudes should also prove to be beneficial.

I have advised Mr. Jack Cleveland, Assistant Superintendent for Instruction, of your research study and he will provide assistance in the mechanics of testing.

GSD/pm

APPENDIX B

SCHOOL SENTIMENT INDEX

SCHOOL SENTIMENT INDEX: PRIMARY LEVEL

1. Is your teacher interested in the things you do at home?
2. When you are trying to do your schoolwork, do the other children bother you?
3. Does your teacher care about you?
4. Do other children get you into trouble at school?
5. Do you like being at school?
6. Would you be happier if you didn't have to go to school?
7. Does your teacher give you enough time to finish your work?
8. Are the grown-ups at school friendly toward the children?
9. Do you like learning to read in school?
10. Are you usually afraid to ask your teacher a question?
11. Are the other children in your class friendly toward you?
12. Are you scared to go to the office at school?
13. Do you like to paint pictures at school?
14. Do you like to listen to stories in school?
15. Is school fun?
16. Does your teacher like to help you with your work when you need help?
17. Do you like doing arithmetic problems at school?
18. Are the rooms in your school nice?
19. Do you like to learn about science?
20. Do you like to sing songs with your class?
21. Does your school have too many rules?

22. Do you like the other children in your class?
23. Would you like to be somewhere other than school right now?
24. Does your teacher like some children better than others?
25. Do other people at school really care about you?
26. Does your teacher yell at the children too much?
27. Do you like to come to school every day?
28. Does your teacher get mad too much?
29. Do you feel lonely at school?
30. Do you have your own group of friends at school?
31. Do your classmates listen to what you say?
32. Do you like to learn about other people?
33. Do you wish you could stay home from school a lot?
34. Is school boring?
35. Are there a lot of nice things to do at school?

APPENDIX C

BREAKDOWN OF ANALYSES

BY

MAIN EFFECTS AND INTERACTIONS

ANALYSIS OF COVARIANCE

TOTAL BATTERY

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIFICANCE OF F
COVARIATES	249339.989	1	249339.989	395.689	.000
TOTAL BATTERY PRETEST	249339.989	1	249339.989	395.689	.000
MAIN EFFECTS	8876.998	3	2958.999	4.696	.004
PROGRAM	6289.259	1	6289.259	9.981	.002
GRADE LEVEL	143.929	1	143.929	0.228	.663
SEX	1243.136	1	1243.136	1.973	.162
2-WAY INTERACTIONS	1461.680	3	487.227	0.773	.510
PROGRAM GRADE LEVEL	1026.701	1	1026.701	1.629	.204
PROGRAM SEX	292.677	1	292.677	0.464	.496
SEX GRADE LEVEL	28.539	1	28.539	0.045	.832
3-WAY INTERACTIONS	323.250	1	323.250	0.513	.475
PROGRAM GRADE LEVEL SEX	323.250	1	323.250	0.513	.475
EXPLAINED	260001.917	8	32500.240	51.576	.000
RESIDUAL	108384.326	172	630.141		
TOTAL	368386.243	180	2046.590		

ANALYSIS OF COVARIANCE

TOTAL READING

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIFICANCE OF F
COVARIATES	933358.279	1	933358.279	702.715	.000
TOTAL READING PRETEST	933358.279	1	933358.279	702.715	.000
MAIN EFFECTS	28236.280	4	7059.070	5.315	.000
PROGRAM	21991.622	1	21991.622	16.557	.000
GRADE LEVEL	1805.150	2	902.575	0.680	.508
SEX	173.791	1	173.791	0.131	.718
2-WAY INTERACTIONS	10962.397	5	2192.479	1.651	.147
PROGRAM GRADE LEVEL	8578.430	2	4289.215	3.229	.041
PROGRAM SEX	12.502	1	12.502	0.009	.923
SEX GRADE LEVEL	1926.374	2	963.187	0.725	.485
3-WAY INTERACTIONS	4698.965	2	2349.482	1.769	.173
PROGRAM GRADE LEVEL SEX	4698.965	2	2349.482	1.769	.173
EXPLAINED	977255.921	12	81437.993	61.314	.000
RESIDUAL	333382.772	251	1328.218		
TOTAL	1310638.693	263	4983.417		

ANALYSIS OF COVARIANCE

TOTAL LANGUAGE

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIFICANCE OF F
COVARIATES	289719.035	1	289719.035	181.483	.000
TOTAL LANGUAGE PRETEST	289719.035	1	289719.035	181.483	.000
MAIN EFFECTS	20334.037	3	6778.012	4.246	.006
PROGRAM	11755.189	1	11755.189	7.364	.007
GRADE LEVEL	8661.591	1	8661.591	5.426	.021
SEX	389.009	1	389.009	0.244	.662
2-WAY INTERACTIONS	218.180	3	72.727	0.046	.987
PROGRAM GRADE LEVEL	21.163	1	21.163	0.013	.908
PROGRAM SEX	141.444	1	141.444	0.089	.766
SEX GRADE LEVEL	47.434	1	47.434	0.030	.863
3-WAY INTERACTIONS	318.364	1	318.364	0.199	.656
PROGRAM GRADE LEVEL SEX	318.364	1	318.364	0.199	.656
EXPLAINED	310589.616	8	38823.702	24.320	.000
RESIDUAL	274579.942	172	1596.395		
TOTAL	585169.558	180	3250.942		

ANALYSIS OF COVARIANCE

TOTAL MATHEMATICS

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIFICANCE OF F
COVARIATES	189583.276	1	189583.276	181.953	.000
TOTAL MATH PRETEST	189583.276	1	189583.276	181.953	.000
MAIN EFFECTS	15311.409	3	5103.803	4.898	.003
PROGRAM	9168.138	1	9168.138	8.799	.003
GRADE LEVEL	1353.361	1	1353.361	1.299	.256
SEX	2424.829	1	2424.829	2.327	.129
2-WAY INTERACTIONS	1780.657	3	593.552	0.570	.636
PROGRAM GRADE LEVEL	1479.300	1	1479.300	1.420	.235
PROGRAM SEX	198.818	1	198.818	0.191	.663
SEX GRADE LEVEL	1.183	1	1.183	0.001	.973
3-WAY INTERACTIONS	86.982	1	86.982	0.083	.773
PROGRAM GRADE LEVEL SEX	86.982	1	86.982	0.083	.773
EXPLAINED	206762.324	8	25845.291	24.805	.000
RESIDUAL	179213.333	172	1041.938		
TOTAL	385975.657	180	2144.309		

ANALYSIS OF VARIANCE

ATTITUDE TOWARD SCHOOL

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIFICANCE OF F
MAIN EFFECTS	1556.781	4	389.195	10.521	.000
PROGRAM	772.963	1	772.963	20.895	.000
GRADE LEVEL	250.509	2	125.254	3.386	.035
SEX	650.992	1	650.992	17.597	.000
2-WAY INTERACTIONS	351.453	5	70.291	1.900	.095
PROGRAM GRADE LEVEL	154.134	2	77.067	2.083	.127
PROGRAM SEX	158.659	1	158.659	4.289	.039
SEX GRADE LEVEL	3.500	2	1.750	0.047	.954
3-WAY INTERACTIONS	63.588	2	31.794	0.859	.425
PROGRAM GRADE LEVEL SEX	63.588	2	31.794	0.859	.425
EXPLAINED	1971.822	11	179.257	4.846	.000
RESIDUAL	9544.330	258	36.994		
TOTAL	11516.152	269	42.811		

APPENDIX D

T-TEST BREAKDOWNS

t-TEST

TOTAL BATTERY

Group	Number of Cases	Mean	Standard Deviation	Standard Error	t Value	Degrees of Freedom	2-Tail Probability
Experimental	90	64.744	31.681	3.339			
					-0.20	179	0.843
Control	91	65.802	39.563	4.147			

t-TEST

TOTAL READING

Group	Number of Cases	Mean	Standard Deviation	Standard Error	t Value	Degrees of Freedom	2-Tail Probability
Experimental	134	100.858	76.459	6.605			
					0.93	262	0.355
Control	130	92.839	63.266	5.549			

t-TEST

TOTAL LANGUAGE

Group	Number of Cases	Mean	Standard Deviation	Standard Error	t Value	Degrees of Freedom	2-Tail Probability
Experimental	90	60.878	44.145	4.653			
					0.66	179	0.511
Control	91	56.088	53.138	5.570			

t-TEST

TOTAL MATHEMATICS

Group	Number of Cases	Mean	Standard Deviation	Standard Error	t Value	Degrees of Freedom	2-Tail Probability
Experimental	90	77.267	42.584	4.489			
					0.19	179	0.846
Control	91	75.956	47.754	5.006			

t-TEST

ATTITUDE TOWARD SCHOOL

Group	Number of Cases	Mean	Standard Deviation	Standard Error	t Value	Degrees of Freedom	2-Tail Probability
Experimental	140	28.200	5.596	0.473			
					4.19	268	0.000
Control	130	24.962	7.075	0.621			

t-TEST

TOTAL READING: GRADE ONE

Group	Number of Cases	Mean	Standard Deviation	Standard Error	t Value	Degrees of Freedom	2-Tail Probability
Experimental	47	178.894	57.937	8.451			
					2.05	84	0.044
Control	39	154.256	52.619	8.426			

t-TEST

TOTAL READING: GRADE TWO

Group	Number of Cases	Mean	Standard Deviation	Standard Error	t Value	Degrees of Freedom	2-Tail Probability
Experimental	40	78.375	54.857	8.674			
					-0.28	81	0.781
Control	43	81.674	52.646	8.028			

t-TEST

TOTAL READING: GRADE THREE

Group	Number of Cases	Mean	Standard Deviation	Standard Error	t Value	Degrees of Freedom	2-Tail Probability
Experimental	47	41.957	28.076	4.095			
					-1.62	93	0.110
Control	48	52.938	37.420	5.401			

t-TEST

ATTITUDE TOWARD SCHOOL: MALES

Group	Number of Cases	Mean	Standard Deviation	Standard Error	t Value	Degrees of Freedom	2-Tail Probability
Experimental	76	27.500	6.043	0.693			
					4.09	138	0.000
Control	64	22.656	7.959	0.995			

t-TEST

ATTITUDE TOWARD SCHOOL: FEMALES

Group	Number of Cases	Mean	Standard Deviation	Standard Error	t Value	Degrees of Freedom	2-Tail Probability
Experimental	64	29.031	4.931	0.616			
					2.05	128	0.042
Control	66	27.197	5.257	0.647			