1971

A comparison of student attitudes in selected Iowa high schools

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A comparison of student attitudes in selected Iowa high schools

by

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A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Major Subject: Educational Administration

Approved:

Signature was redacted for privacy.

In Charge of Major Work

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Head of Major Area

Signature was redacted for privacy.

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Ames, Iowa

1971

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ACKNOWLEDGMENTS

I wish to extend my sincerest appreciation to Dr. Richard P. Manett for his interest and support through this study.

Appreciation is also expressed to Dr. Anton Netusil for his assistance with the statistical analysis.

Sincere thanks go to Dr. Ray Bryan, Dr. Ross Engel, Dr. Dwight Bensend, and Dr. Clair Watson for serving on my committee.

A final word of thanks to my wife and children for their encouragement and patience during this long pursuit.

INTRODUCTION

Improvement of instruction has been of concern to educators since the early years of education. Pressures from various forces within society have demanded that the schools do something to upgrade their end product, the student. Because of this, curricula have undergone radical change. They have moved from a rigid content centered curriculum to a flexible student centered curriculum as stated in the Encyclopedia of Educational Research (4, p. 361):

> In the early history of education, the curriculum was a social and intellectual bank in which was deposited the accumulated wisdom of people to be drawn upon as needed by its youth. At present the trend is definitely toward a flexible curriculum, where the planning is done primarily in terms of the developing needs and abilities of the learners against the background of the needs of society, the relative usefulness of various knowledges and skills, and the logical and psychological nature of learning.

In recent years many innovative practices have been attempted throughout the country. Some of these practices have been implemented in a few of the schools in the state of Iowa. Their implementation has been based on the philosophy that these practices would bring the necessary flexibility into the school system so that the teaching-learning situation might be improved. They assume that if these practices facilitate the teaching-learning situation, they will result in higher achievement and improved attitudes toward the school by the student.

Statement of the Problem

The purpose of this study was to determine if an organization and methodology including team teaching, large group and small group instruction, modular scheduling, and independent study in selected Iowa high schools was effective in improving the attitudes toward their school and raising the level of achievement of students in comparison to programs of instruction not utilizing all of these practices. The study attempted to answer the following questions:

Question 1: Do students in schools using team teaching, large group and small group instruction, modular scheduling, and independent study have a more positive attitude toward school than students in non-innovative schools?

Question 2: Is there a positive correlation between the attitudes of students in either innovative or non-innovative schools and the attitude of their instructors?

Question 3: Do instructors in innovative schools have a more positive attitude toward school than instructors in non-innovative schools?

Question 4: Do students in innovative schools tend to achieve higher than students in non-innovative schools as measured by grade point average (GPA), rank in class, and/or Iowa Tests of Educational

Development (ITED) results?

Question 5: Is there a significant difference in attitude between sexes in either innovative or non-innovative schools?

Question 6: Do attitudes held by students vary with size of school?

Question 7: Are innovative schools more successful in raising the level of achievement of students than non-innovative schools?

Question 8: Is there a significant correlation between attitude and achievement in school?

In answering these questions the following null hypotheses were tested:

Null Hypothesis 1: There is no significant difference in attitude as measured by an attitude scale between students in innovative schools and students in non-innovative schools.

Null Hypothesis 2: There is no significant correlation between the attitudes of students and the attitudes of faculty members in either innovative or non-innovative schools.

Null Hypothesis 3: There is no significant difference in attitude between instructors in innova-

tive and non-innovative schools.

Null Hypothesis 4: There is no significant difference in attitude as measured by the High School Characteristics Index (HSCI) between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex.

Null Hypothesis 5: There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of intellectual aptitude.

Null Hypothesis 6: There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of school size.

Null Hypothesis 7: There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the

basis of sex and school size.

Null Hypothesis 8: There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex and intellectual aptitude.

Null Hypothesis 9: There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of school size and intellectual aptitude.

Null Hypothesis 10: There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of school size, sex, and intellectual aptitude.

Null Hypothesis 11: There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative

schools as measured by cumulative grade point average, rank in class, and/or ITED results.

Null Hypothesis 12: There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex.

Null Hypothesis 13: There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of school size.

Null Hypothesis 14: There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of intellectual aptitude.

Null Hypothesis 15: There is no significant difference in achievement scores, rank in class, or GPA between students in innovative

schools and students in non-innovative schools when students are also categorized on the basis of sex and intellectual aptitude.

Null Hypothesis 16: There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex and school size.

Null Hypothesis 17: There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of school size and intellectual aptitude.

Null Hypothesis 18: There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex, school size, and intellectual aptitude.

Definition of Terms

Before the material of this study is considered, it seems necessary to make clear the meaning of certain terms employed in this discussion.

Team teaching - An arrangement by which teachers cooperatively plan, instruct and evaluate a group of students.

Large group instruction - Instruction involving groups of more than 15 students.

Small group instruction - Instruction of students in groups of 15 or less.

Modular scheduling - Scheduling facilitating units composed of time, class size, and course structure in combination.

Independent study - Study in depth, pursued by the student in areas of his interest.

Innovative school - Schools that use team teaching, large group instruction, small group instruction, modular scheduling, and independent study.

Non-innovative schools - Schools that do not use all five factors as stated for innovative schools.

ITED (Iowa Test of Educational Development) - An achievement test taken by all students in the study in the fall of 1969. The composite standard score was used in this study.

Intellectual Aptitude Test - The Otis Classification

Quick Score (verbal form) or a comparable test given to all students in the study.

School size - Size was determined by total enrollment of grades 10-12 of the high school. The levels of size used were as follows: (1) above 1000 pupils, (2) 400 to 500 pupils, and (3) under 200 pupils.

Attitude scale - The High School Characteristics Index, Form 960, given to all students and faculty members in the study to ascertain the attitudes of both students and faculty toward the school environment.

Grade level - Students used in this study were seniors in high school.

Intellectual aptitude level - Three classifications were considered in the study: (1) below 90, (2) 90 to 110, and (3) above 110.

Grade point average - Cumulative average through the senior year in high school based on a 4.0 point scale.

Rank in class - The rank in class of each student at the end of his senior year.

Delimitations of the Study

The scope of this investigation was confined to selected Iowa high schools categorized by size and innovative practices during the 1968-69 school year. The innovative schools were using team teaching, large group instruction, small group instruction, modular scheduling, and independent study

in some phase of their school program. The non-innovative schools were considered as those schools not using all five of these practices.

This study included males and females in grade twelve only, during the 1969-70 school year. The students were further categorized into three groups of intellectual aptitude as measured by an intellectual aptitude test: (1) below 90, (2) 90 to 110, and (3) above 110.

The study was restricted further in that no attempt was made to measure improvement of attitude within the innovative or non-innovative schools. Attitude was measured at a specific point in time.

After the innovative schools were selected, the non-innovative schools were chosen only in relation to size.

Sources of Data

The State Department of Public Instruction publication Administrative and Instructional Practices in Iowa Schools, 1968-1969 School Year (2) was used to determine the innovative schools in this study. The information in this publication was secured through a questionnaire sent to all public high school districts in Iowa.

Data on Iowa Schools, 1967-68 School Year (17) was used to categorize the schools by size.

The 1969 Iowa Test of Educational Development provided the achievement scores of each student in the sample. The

High School Characteristic Index, Form 960, was administered to senior students and faculty members in each of the six schools in the study and provided the attitude score used in the study.

Each school in the study furnished the sex, ITED score, class rank, intellectual aptitude, and grade point average information used in this study.

Organization of the Study

This study is organized into five chapters. The first chapter includes the introduction, statement of the problem, definition of terms, delimitations, sources of data, and the organization of the study. The second chapter contains the review of related literature and research. Chapter three describes the methods and procedures used in the study. The fourth chapter presents and describes the findings. Chapter five presents a summary of the findings, conclusions concerning the findings, limitations of the study, and recommendations for further research.

REVIEW OF RELATED LITERATURE

In reviewing the literature it was apparent that secondary school education has been in a constant state of change since its inception in the United States. In recent years change has been so fast that Friedlander (24, p. 11) remarked:

> The spirit of innovation is perhaps the most outstanding characteristic of today's educational scene. The rapid pace of change carries with it the danger that innovations become tomorrows' orthodoxies despite the absence of clear evidence that they can live up to the expectations for improvement that they arouse.

Free education for all, compulsory education, and the comprehensive high school have been three major changes since the early 1800's (10). But, pressures from within our society have increased the need for further change. This change is far different than what has been achieved in the past. Today's education is going through a qualitative rather than a quantitative change. As Bush and Allen (10, p. 2) stated:

> The new goal which is now beginning to emerge refers not to amount and numbers (i.e., everyone in school for a given number of years) - quantitative standard of the past - but rather to a quality of excellence to be achieved in the education provided for everyone in high school. While the debate over what shall constitute an education of the highest quality for each pupil has not been concluded, more than a suggestion emerges that the new aim may be even more lofty in its conception than its predecessor. The new goal emerging from public discussion of secondary education is this: All youth shall, by the end of compulsory schooling, be so launched on a broad, liberal education that they will continue such educa-

> tion as a lifelong pursuit. Further, each person's education will have been so planned that he will have opportunity to develop, as early as his talents are discovered, and be encouraged to develop one or more lines of specialization which will represent the flowering of his own unique interests and abilities.

This is a major change from the earlier philosophy that high school students should have a liberal background, but not specialize until after the completion of high school.

To upgrade the quality of education for each student, it was necessary to develop improved programs of instruction to suit the individual's needs. It went without saying that improvement of instruction must show a marked change in attitudes of students toward the school environment and an increase in their achievement if, in fact, instruction had been improved.

This chapter has been divided into the following areas that seem appropriate for this study: (1) innovation - definition, examples and research, and on-going programs; (2) attitudes - definitions and research; and (3) analysis of the instrument used to measure student attitude toward their school environment - the High School Characteristics Index.

Innovation

Innovation has been defined in many ways, and means different things to different writers. To some it would seem that innovations are frequently administrative gimmicks that do little to change the school, much less

improve the educational setting (41). Innovations should change the educational setting so that opportunity for learning can be maximized. Gibbons (25, p. 31) made this statement regarding innovation:

> I recommend one operating principle for changes in this direction: innovations should involve change in the relationship between the student and his teachers concerning the act of learning, change in the opportunities for learning (range of situations, facilities, personnel), and change in the distribution of authority. Modification of content or organization alone tend to be superficial.

This study will consider innovation as any change, excluding program of instruction, brought about intentionally that makes it easier to accomplish the goals of the school. This definition is similar to Miles' (43, p. 14) statement that:

> Generally speaking, it seems useful to define an innovation as a deliberate, novel, specific change, which is thought to be more efficacious in accomplishing the goals of the system.

Innovations can make schools more flexible so that certain goals can be attained. A flexible school has structure, but not the rigid structure of the past (33). The structure serves the student and the teacher so that the student has the opportunity to develop greater initiative and responsibility, improve his study skills and attitudes, improve his ability to think critically, and increase his academic achievement (62).

Many types of innovations were described in the litera-

ture. Those described most frequently were flexible modular scheduling, team teaching, large and small group instruction, independent study, differentiated staffing, programmed instruction, honor study halls, ability grouping, ungraded schools, and curriculum programs such as UICSM mathematics, SMSG mathematics, BSCS biology, CBA chemistry, and ESCP earth science (1), (10), (22), (76). Some of these have been in use since the early 1900's (3).

A survey by the North Central Association was reported by Cawelti (12). The survey included 10,266 accredited schools. The results of the survey led him to remark (12, p. 58):

> The diffusion rate for accepting new ideas is now more rapid in secondary schools than it was before. Change in American education has moved from a crawl to a walk.

The survey reinforced the feeling of Friedlander (24), when Cawelti (12, p. 58) said:

> A careful search of the literature discloses an abundance of material on so-called innovations in curriculum, technology, and organization. But little is known about the effects of different treatments or strategies of learning over a meaningful period. This is perhaps the most discouraging aspect of what some call the band wagon phenomena with innovation.

Cawelti indicated very few of the changes are truly innovations. But, some that he feels are innovative by any standard are differentiated staffing, flexible modular scheduling, and computer assisted instruction.

The latest upsurge in the use of these innovations was

forecast by Trump (77) in 1959 in his book Images of the Future.

Trump probably was more instrumental in igniting recent innovation than any other author. He pointed the way toward overcoming organizational handicaps that have bound the schools for generations. The school of the future, as he predicted, would be developed around three kinds of activities: large-group instruction, small group instruction, and individual study. He said (77, p. 14):

> An underlying purpose of the school will be to develop ability to study, think, and solve problems in contrast to todays' emphasis on memorizing facts. In large groups, small-group discussions, and individual study, the emphasis will be put on the goal of helping the student develop the ability to solve problems on his own.

Trump has made educators conscious of possible ways to truly individualize instruction.

Incorporating many of Trump's ideas, Bush and Allen (10) developed A New Design For High School Education Assuming A Flexible Schedule. This book outlined a flexible arrangement which considers the differences of students, instructors, and subject areas. This plan has been put into operation in many school systems.

Numerous schools have implemented Trump's plan as well in recent years; however, limited research is available on specific schools that are innovative compared to those that are non-innovative.

The literature indicates that not all innovations seem to be as effective as hoped. Cawelti (12) indicates that individual studies show that flexible scheduling does not make a difference in achievement, but he advocates its use so that the superior teacher can be used more effectively. A clearer picture may be seen as schools use innovations over a longer period of time.

In a study on modular scheduling, Speckhard (63) evaluated academic achievement, study habits, attitudes, ability to think critically, and development of self-direction and self-responsibility. The experimental school in the study used a modular schedule of 27 "mods" of 15 minutes each. The control school used the typical 55 minute, six period schedule. With the modular schedule, the experimental school utilized independent study, large and small group instruction, unstructured free time, and team teaching in English and mathematics.

He found that students achieved as much or more in the experimental school as in the control school. Students in the experimental school developed a significantly higher ability in critical thinking. General academic growth was shared equally by both boys and girls and at all achievement levels. There were no significant findings concerning attitudes. In the area of unsupervised study, students of average and below-average ability experienced some diffi-

culty in adjusting.

An on-going project at the University of Chicago Laboratory School designed to encourage freshman students to take more responsibility in determining how, when, and where they should study was reported by Congreve (14) at the end of the fourth year of the project. Students were given the opportunity to choose the amount of independent study they would like to have. There were three levels of independent study. The analysis revealed that the students of higher ability and achievement chose the most independent study, while students with less ability chose their mode of learning more in keeping with their ability and achievement.

It was found that the students learned as much as students taught in a traditional classroom and in critical thinking did better than was expected. The more able students seemed to gain more in writing and inquiry skills.

A study by Zweibelson (83, p. 3) of team teaching and ability grouping disclosed: "Students in high ability tracks tended to have more negative attitudes toward the school than those in lower ability groups." The findings indicated that ability grouping did not improve the motivation toward learning or improve the attitude toward school.

Two studies indicated that innovations may be effective only if the instructor is inventive and above average. Devine (18) found that attitudes of students were good

toward school and toward programmed instruction if the instructor was above average. Achievement, likewise, was as good or better with programmed instruction if the instructor was average or above. In the case of both attitudes and achievement, the students did not score well if the teacher was below average.

Frey, Shimabukuro, and Woodruff (23) found that there was a marked decline in both attitudes and achievement when there was little variety in instruction in their study comparing traditional and programmed instruction. As attitudes became negative, achievement declined.

A study by Marks (42), comparing new and traditional programs in chemistry, showed no significant difference in achievement when ability was held constant. The Chemical Bond Approach was compared with the traditional approach to chemistry in this study.

Vogel and Bowers (79), in a study of the effect of school organization on attitudes, achievement, and behavior, found that the nongraded school encouraged pupil development in conceptual maturity. The traditional graded form of organization encouraged pupil development in achievement and attitude toward school.

A Colorado study reviewed by Cawelti (12) found that students and teachers had favorable attitudes toward flexible scheduling. It provided greater individualization of in-

struction. The low achievers had more difficulty with independent study than did the students that were average or above. It was found that students learned as well or better than students in a traditionally scheduled school, but tests showed that students in a flexibly scheduled school showed improvement in critical thinking.

There are several on-going experiments from which data cannot yet be obtained. Five of these will be explained briefly in the next few pages.

The Stanton School District, Wilmington, Delaware,[1] has embarked on an individualized-progress curriculum. This program is funded through the federal government. The high schools are developed on an ungraded-individualized curriculum design. The curriculum has been constructed with a basic philosophy of educating each individual to the maximum of his capacity, and to teach him how to continue his education throughout his life.

The program uses modular scheduling, large group instruction, small group instruction, and independent study. The students are unscheduled for about 35 per cent of their time. During this free time they may choose to work in any one of many subject area resource centers, the library, the laboratories, the quiet study area, or the lounge. A great

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[1]W. P. Keim, Stanton School District, Wilmington, Delaware. Information concerning new program. Private correspondence. 1970.

amount of the individualized study is accomplished using programmed instruction.

It has been found through their research, that the student does not effectively use about one third of his unscheduled time. This amounts to about 14 per cent of the school day, which includes lunch time. The district believes that since the student uses his free time wisely, more unscheduled time for each student is planned for the future.

A second program is a Title III project at Moberly, Missouri.[1] Moberly High School is using modular scheduling so that individualized instruction can be accomplished to a greater degree than in a traditionally scheduled school. It also makes it possible to utilize the instructors' strengths and compensates for their weaknesses through team teaching. In this program, emphasis is placed on the individual student who is made responsible for his own learning.

This program has been in operation for two years. The initial program started four years ago and was revised after two years to the program now in progress. All scheduling in this system is done by computer.

The third program also is an ESEA Title III project.[2]

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[1]W. R. Koelling, Moberly Public Schools, Moberly, Missouri. Information concerning new program. Private correspondence. 1970.

[2]Alan Farley, Andrew Lewis High School, Salem, Virginia. Information concerning new program. Private correspondence. 1970.

This program is in Andrew Lewis High School, Salem, Virginia. In 1968 the traditional mode of scheduling was discarded and a flexible modular schedule was put in its place. Study halls were eliminated and 39 new courses were inserted into the curriculum. The object was to give the students a broader curriculum, more responsibility regarding their free time, and more time for independent study.

Because of the modular schedule, implementation of large group and small group instruction became a reality. The schedule is developed by computer. Class sizes range from 6 to 160 and may meet for any length of time desired up to 105 minutes on 15-minute modules. Students have as much as one-third of their time unstructured, thus permitting them to learn as the philosophy of "going ahead independently" indicates. At the present time Andrew Lewis High School is conducting an evaluation of the total program.

A fourth project is the West York Area Plan.[1] This is a Title III program in the junior high school in York, Pennsylvania, that attempts to meet the individual needs of students through the process of flexible-modular scheduling, large group and small group instruction, and independent study.

Teacher teams of 3 members and one teacher-aide work

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[1]Mrs. Jean Ann Myers, West York Area School District, York, Pennsylvania. Information concerning new program. Private correspondence. 1970.

with groups of 90-100 students within a block of time in three subject matter areas. The team meets daily to correlate their work; choose varied sized groups of children; and plan use of the facilities, and the time element to be expended. All members of the team are of equal status.

The classes are organized in flexible or traditional ways as the situation dictates. Subject areas may be merged or completely separate, depending on the unit of study.

This program has been in operation since the 1968-69 school year. Each year it is changed to meet the needs of the student and to utilize the staff most effectively.

The fifth program is at Wilson Campus School, Mankato, Minnesota.[1] It is organized on a completely individualized basis in grades K-12. There are no bells or time limits. Students may study in one area all day or work in a number of areas as it suits their needs. The school is open 24 hours a day, seven days a week, and follows the philosophy, as stated by their principal, Don Glines (26, p. 399): "If the schools are to be significantly better, they must be significantly different."

Glines feels that modular scheduling is already obsolete. Glines prefers to offer the student a "menu" each day so that he may sample what he feels is needed each day.

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[1]Dr. Don Glines, Wilson Campus School, Mankato, Minnesota. Information concerning new program. Private correspondence. 1970.

This school operates on the same principle as the old country school. Students may range in age from 5 to 18 in any one class. Attendance is optional and the emphasis is toward working with the individual, not the group.

The National Association of Secondary School Principals has in progress a Model Schools Project (76). The project is another program that J. Lloyd Trump has been instrumental in developing. There are 34 model schools throughout the country involved in the project that is designed for five years and is partially financed by the Danforth Foundation.

The program is based on three assumptions: (1) since innovations have often been superficial rather than real it is assumed that it is possible to make major organizational changes without altering the way in which teachers and pupils function; (2) innovations have not been adopted in the entire system, thereby nullifying its potential; and (3) new roles for both the teacher and pupil must develop, and they must be active participants in this development.

The project is attempting to demonstrate how a network of schools may change their programs from traditional to innovative over a five year period of time. An attempt is being made to define a change strategy that will work effectively for all schools. It embodies a change in the roles of both the teachers and the pupils, redefining the leadership priorities of the principal, refining the curri-

culum, and utilizing buildings, equipment, supplies, and money more efficiently.

Attitudes

It was apparent from the literature that attitude has been of interest to man for centuries. However, the bulk of literature on this subject concerning attitudinal factors in the education process has been written in the last 20 years (9).

Attitude has been defined in many ways, as are most abstract terms. It has been defined as a person's consistency in response to objects of his environment (11). This agrees with Allport's definition that although attitude has more than one meaning, it is a mental state of preparation for both action and fitness, which he defines further in Fishbein (19, p. 8):

> An attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related.

Oppenheim (52) also saw attitude as a state of readiness in which the individual has a tendency to act or react in a particular way when confronted by a certain stimulus. Further, he felt attitudes were not formed in a logical fashion. They are formed, modified and discarded because of the reaction of others. Attitudes are highly emotional and will arouse strong defense mechanisms within the holder to

preserve the specific attitude and resist change.

Cronbach (16), like Oppenheim, stated attitudes can be confirmed or modified by repeated trials. Each time a person acts or expresses an opinion, his interpretation is supported or contradicted by the reaction of others.

A broader definition of attitude was used by Thurstone (72, p. 554), who said:

> Attitude is the sum total of man's inclinations, feelings, prejudices, bias, preconceived notions, ideas, fears, threats, and convictions about any specific topic.

Sherif, Sherif, and Nebergall (60) defined attitudes as the stand the individual takes concerning objects, issues, persons, groups, or institutions. Further, they agreed with Allport that attitudes are inferred from a consistent mode of behavior toward objects within the environment.

Attitudes may be either positive or negative as Sherif and Sherif (59, p. 115) wrote:

> Operationally, an attitude may be defined as the individual's set of categories for evaluating a stimulus domain, which he has established as he learns about that domain in interaction with other persons and which relate him to various subsets within the domain with varying degrees of positive and negative affect.

Katz, in Fishbein, (19, p. 459) concurred with them:

> Attitude is the predisposition of the individual to evaluate some symbol or object or aspect of his world in a favorable or unfavorable way.

Allport, in Fishbein, (19, p. 47), after studying over

100 definitions of attitude, concluded that: "Attitude is a learned predisposition to respond to an object in a consistently favorable or unfavorable way."

It would seem helpful to those in education to be able to predict the behavior of students in a given situation if the attitudes of the students were known. But Fishbein (19) indicated there is very little consistent evidence that, although the attitude toward some object is known, the behavior of the person toward the object cannot be predicted. He felt the situation brings in a variable that cannot be predetermined.

Attitude may also be thought of as opinion, as Thurstone (72, p. 26) said:

> Opinion is the verbal expression of attitude. Actually, then, an opinion is a symbol of an attitude. Opinions may be used as the means for measuring attitudes.

Allport, in Fishbein, (19, p. 7) agreed when he said: "Public opinion is the highest form of collective attitudes." Therefore, opinion may be used to measure attitude as stated by Allport (19, p. 9):

> The simplest method for determining how common an attitude (really an opinion) may be in a certain population is by counting ballots or by tabulating answers to a questionnaire. Roughly, this method may be said to "measure" the range and distribution of public opinion, although it does not, of course, determine the intensity of the opinion of any given individual upon the issue in question.

Katz and Allport (38) indicated people have two sets of

attitudes on many questions. One attitude is their public opinion which they will relate to most people. The other attitude is their private attitude which they will relate only to those closest to them. People are likely to give their public opinion when questioned or when writing a questionnaire. If the questionnaire forms are anonymous, however, they are likely to respond with their private attitudes.

Sherif, Sherif, and Nebergall (60) reinforced this theory when they reported that a study in 1962 indicated that students don't always reveal their true attitudes when they are being tested. If they feel their responses may be checked by someone they know, they will likely give the socially acceptable response rather than their true feelings.

Krech, Crutchfield, and Ballachey (39) felt that the measurement of attitudes is necessarily indirect as is the measurement of all psychological determinants, but attitudes can be measured on the basis of inferences drawn from the responses of the individual toward an object.

Attitudes are important to people in education. This variable apparently has a significant effect upon the performance of the student and must be taken into account. As Brodie (9, p. 375) stated:

The character of student attitudes toward school and

> education in general has posed problems of both theoretical and practical importance to educators. During the past two decades, particularly, an impressive body of professional literature has borne on attitudinal factors in the educative process. It has been asserted that such concern is pragmatically justified in the light of a logical relationship to such school phenomena as under-achievement, failure, conduct problems, and dropouts.

It must be remembered that because attitudes are highly emotional they will be difficult to change. This is a problem that educators must deal with as they attempt to improve the teaching-learning situation.

There has been a large quantity of research done in recent years on attitudes and achievement. It would seem impossible to review it all in this work. Only those that seemed most appropriate for this study were reviewed.

In a study of 2300 high school students, grades 9-12, Brodie (9) found that attitude must be considered when achievement is studied. He used a student opinion poll to determine attitudes and the Iowa Tests of Educational Development to determine achievement. Satisfied students scored significantly higher on seven of the nine tests of the ITED. Only Background in Natural Sciences and Vocabulary were not found to be significant, which led him to conclude (9, p. 378):

> A negative attitude toward school would thus appear to have a particularly inhibitory effect on those learnings which are emphasized in the classroom and be less influential on those not as closely identified with school and education in a formal sense.

Austrin (5), in a study that investigated the relationship between attitude and academic achievement, also found that attitude and achievement were closely related.

A study by Devine (18), designed to determine whether programmed instruction was as effective as traditional instruction, found that attitude toward the teacher was the determining factor. Student attitudes were good using either method of instruction when the teacher was good to average. Attitudes toward either method were negative when the teacher was poor. Achievement was better with an average to good instructor, using a traditional method of instruction. However, if the teacher was poor or inexperienced, the students would achieve better using programmed instruction.

Frey, Shimabukuro, and Woodruff (23) found that when there was a negative attitude change, there was a marked decline in achievement. They also found that if programmed instruction were used constantly over a long period of time with no variety in instruction, it brought about a decline in attitude and achievement. It would seem motivation for classroom learning is a major problem in education. For, unless the student is motivated, little will be accomplished.

A study by Hummel and Sprinthall (34) found significant differences between under-achievers and superior achievers on scales postulated to measure adaptive aspects of ego functioning. The ego structure changes and develops as an

individual matures and learns. They stated (34, p. 389):

> At any given moment, however, it influences significantly the manner in which a person governs his needs and impulses and guides his instrumental behavior in response to the tasks and opportunities in his external world.

Many factors other than ego obviously determine an individual's academic achievement, but (34, p. 389):

> Despite such exceptions, we are still persuaded to the postulate that underachievement, in the general case of the bright student, is a valid indicator of an immature ego.

The study suggested that superior achievers are more mature, better planners, more thoughtful, and more willing to work at the tasks rather than postpone them, than are the underachievers. Hummel and Sprinthall (34, p. 395) said finally:

> The data thus supports the postulate that academic performance is a kind of problem-solving behavior whose level of efficiency is, in each individual, a function of the structure and strength of his ego.

Neidt and Hedlund (49) found that student attitudes toward a particular class become progressively more closely related to achievement as the period of instruction progresses. Attitudes, early in the program, were closely related to final grades.

Goldberg's (27) study found that students perceive different teachers' attitudes differently and perform accordingly. He found that the compulsive student does more work and better work with an authoritarian teacher.

From these studies it would appear that any consideration of student academic success hinges on his attitude toward the school environment and, most importantly, toward the teacher. Teachers and administrators would do well to develop a school environment conducive to positive attitudes if, in fact, they wish to develop the student's abilities to the fullest.

The High School Characteristics Index

It would seem appropriate to discuss briefly the instrument used to measure student attitudes in this study. This is especially true since the value of the instrument was questioned recently in a paper presented at the 1970 AERA meeting in Minneapolis.

The High School Characteristics Index, Form 960, was developed by Stern (65) in 1960. It was constructed to parallel the College Characteristics Index, Form 1158, developed by George G. Stern and C. Robert Pace (69) in 1958. The Index consists of 300 true-false questions, and is designed to obtain a description of the school environment as the student perceives it. The HSCI may be administered to the faculty as well, thereby enabling one to identify perceptual difference of the students and faculty which may be of value in understanding student behavior and motivation.

The instrument yields 30 scores which correspond to

Murray's taxonomy of psychogenic needs (48). Murray developed the dual concept of personal needs and environmental press. Needs refer to denotable characteristics of individuals - drives, motives, goals, etc.; press can be regarded as stimulus, treatment, or process variables (53).

Pace and Stern (53, p. 269) said:

> The concept of press offers a way of viewing the environment which is comparable analytically and synthetically to the more familiar ways of dealing with the individual.

It is imperative that we study the environment if we are to humanize education. We live in a world today that is capable of freeing the individual as never before, but capable also of producing a terrible loneliness and alienation. If we are to facilitate learning we must know more about when, why, and how optimum learning takes place within the student and under what environmental conditions (40). It is up to the teacher to develop an environment conducive to learning. Wilhelms, in Leeper, (40, p. 32) says:

> No child will ever be harmed by a teacher who believes he has it in him to go further than it looks as if he is going to go. We have those 2,000 ordinary working days, and that handful of garden-variety school subjects. It may look like a pitifully small armamentarium for so lofty an assault. But, then, all we really need to do is cultivate the soil and get the seeds started. It's the kids who do the growing. And if we get the conditions right they haven't any way of stopping.

In defining press, Herr(29, p. 685) made this observation:

> The press of a college or high school environment represents that which is faced and dealt with by a student. It is possible that the total pattern of congruence between personal needs and environmental press may be more predictive of achievement, growth, and change than any single aspect of either the person or the environment.

In this study, Herr found evidence that differential perceptions of press do occur. Variables such as sex, socio-economic background, I.Q., and grade level all were associated in differing degrees with the way the student perceives the environment. Herr found the reliability coefficients obtained in the study were irregular and, in several cases, extremely low.

Jones (36), in a study to determine the factorial structure of the HSCI, noted the HSCI should not be interpreted by the same factors as the College Characteristics Index (69).

Mitchell (45) used the instrument to identify and interpret the critical variables or dimensions in the high school environment that have the greatest capacity for empirical differentiation among schools. The study encompassed eleven high schools in a large metropolitan area. There were 2819 students included in the study. He found the 30 variables discriminate rather effectively among the eleven schools. However, he cautions against using only the HSCI as the sole indicator of the environment. It would be well to know more about the social and psychological

factors in the environment that influence student perceptions. But Mitchell felt the data secured by the use of the instrument was of value due to the significant relationship between press for achievement and future educational aspirations as well as the impact of differences in student aggression and opportunities to participate in school activities.

Tolsma, Menne, and Hopper (74) took issue with the reliability of the HSCI. Their study included 3365 junior and senior students. These researchers concluded that the HSCI did not effectively discriminate between groups. They used a ratio of average variance to determine if an item was discriminating. This test is more conservative than an F test.

Mitchell (45) applied a multiple discriminant analysis to the raw score means of each of the 30 variables. He found all 30 discriminating. The results were significant at the .001 level.

Stern (67) revised the norms of the HSCI. In evaluating the scales he found, using 12 schools and 947 students, that they discriminated effectively between schools. He used an analysis of variance to analyze the data and found each scale significant at the .001 level and beyond.

The HSCI has been used in only a few studies. Stern reported that Munger and Myers (1965) (67) compared environments at 10 North Dakota high schools - five having

guidance counselors for three years or more, and five having never had a guidance counselor. They concluded that non-guidance schools were characterized by a conformity, including environment, while the guidance schools encouraged individual initiative.

Herr (1962, 1963, 1965), as reported by Mitchell (45), made an extensive study of the relationships between the HSCI and other variables at a single high school. He found there was an apparent congruence between the press suggested by the HSCI and that inferred from other sources.

Hansen and Herr (1964) obtained findings regarding truancy, as reported by Mitchell (45, p. 384):

> They found press differences between students differing in attendance rate but matched for I.Q., age and socio-economic background. Chronic truants perceived a higher intellectual climate and more emotional constraints than those in regular attendance.

Although the HSCI may appear to be suspect by some, until further studies are made concerning its reliability, the instrument seems to be of value as indicated by several studies. Further analysis should be done, however, to test its reliability and to develop an instrument that is less time consuming for administration.

In summary of the review of literature, innovations appear to be an attempt to change education to keep pace with our ever-changing society. Care must be taken to insure that the changes that are being made are not just for the sake of

changing. Many of the changes seem to be administrative conveniences. They are done more in an effort to appear "modern," and to please the students and parents of the school district than to improve instruction. More intensive research is needed to evaluate which innovations have effectively fulfilled their objectives.

Most important, it would seem, is the necessity to prepare the students for their role in the curriculum. If, in fact, the student is to assume more responsibility for his education, he must be aware of what this entails. Too many students have wasted their time because they were not prepared to handle the added freedom that many innovations permit.

Innovations seem to be of benefit to some students more than others. Students with the ability seem to be able to adjust to the added responsibility better than students that are less able. Care must be taken so that students are not placed in situations with which they are unable to cope.

Attitudes play a very important role in the development of a student. His attitude toward the school may determine what success he will have in the classroom. These attitudes are formed largely in the classroom. The success of any program is dependent upon, in a large part, the classroom teacher. The teacher must develop a classroom climate that propogates positive attitudes.

It is apparent that more work needs to be done comparing innovative and non-innovative schools. Perhaps in the near future, since many on-going projects are still in operation, more can be ascertained relative to the value of innovations concerning the development of positive attitudes and the improvement of achievement.

The High School Characteristics Index has been thoroughly tested and its scales have been revised. It appears to measure the students' attitude toward the school environment effectively and differentiates between groups of students as indicated by several studies. The instrument should be tested further and revised so that it is less time consuming in administration.

METHODS AND PROCEDURES

The methods and procedures used in this study are listed sequentially in this chapter. The procedures include: development of a rationale, delimitations of the study, assumptions, selection of schools, sample, collection of data, and analysis.

Rationale

This study was chosen because the writer believes that not enough research has been done to determine whether innovation makes a significant difference in the teaching-learning situation and results. As Cawelti (12) has indicated, little is known about the effects of innovation and more research in the area should be done. Many schools have innovated without the slightest idea whether or not the innovation has been successful in other schools.

The study was done at a point in time rather than over a long period of time. Therefore, a pre-test, post-test situation was not used for the following reasons:

1. No attempt was made to measure change within a school because the innovative schools studied had been on their programs for at least three years.

2. Moreover, it appears likely that a study concerning change over a short period of time would be influenced by a Hawthorne Effect.

3. It would have been impossible to study change within these particular schools since an attitude inventory would have had to be given four years before to the students in the study.

Attitude and achievement were studied because they are two of the objectives stated by Bush and Allen (10), Speckhard (63), and Thorndike and Hagen (71). Further, they were found to be closely related in studies by Brodie (9), Austrin (5), and Frey, Shimabukuro, and Woodruff (23).

To study the attitudes of students in the schools in the investigation, the High School Characteristics Index, Form 960 (65) was used. The Index was selected because it was familiar to the writer and had been used in several studies including one in Iowa (74). It was found to discriminate effectively between groups of students and between schools by Mitchell (45), Stern (67), and Herr (29). Further, the instrument was being given to the high schools in the study by staff members at Iowa State University. Thus, the instrument was convenient for collection of data on attitudes for this research.

Only seniors were used in the study. Seniors were chosen because a measure of attitude and achievement were desired for students who had been under a program for several years, thereby, hopefully eliminating a Hawthorne Effect.

Austrin (5) found significant relationships between grade point average and class rank when compared to scores on an attitude scale. Zagona and Kelly (82) found a similar relationship between grade point average and attitude. Therefore, both grade point average and class rank were used in the study.

In his study comparing attitudes and achievement, Brodie (9) found there was a significant relationship between sex and achievement as measured by the Iowa Tests of Educational Development.

There is a high correlation between an I.Q. test score and grade point average as reported by Thorndike and Hagen (71). They report an even higher correlation between I.Q. test scores and achievement test scores. Bohy (7) stated that ability is inferred from an I.Q. score.

Herr (29) found that sex differences, mental ability as measured by an I.Q. score, and grade level were closely associated with the way a student perceives his environment.

The variables discussed above were used in the study because of their relationships as they were used in previous studies.

Delimitations of the Study

The study is limited by the definition of innovative and non-innovative schools used in the study; the selection of these schools; and the use of only 1969-70 senior stu-

dents within these schools. The methods and procedures will be conducted within these limits to obtain the objectives of the study.

Assumptions

Two basic assumptions were made concerning the instrument used to measure attitudes in this study. It is assumed that the High School Characteristics Index (65) as developed by Stern is valid and reliable, that it measures the students' attitudes toward the school environment and is effective in differentiating between groups of students. It is also assumed that students used in the study responded to the questions in the Index with their true attitudes and not with their social attitudes.

Selection of Schools

Six schools were selected for the study. Three of these were chosen on the basis of innovative practices as listed in Administrative and Instructional Practices in Iowa Schools; 1968-69 School Year (2). These schools use team teaching, large and small group instruction, modular scheduling, and independent study in their schools. They were categorized by size so that one school was in each strata. The school sizes were determined by use of Data on Iowa Schools; 1967-68 School Year (17). The levels of size are above 1000 pupils, 400 to 500 pupils, and under

200 pupils in grades 10-12 in each high school.

Three non-innovative schools were matched with the innovative schools on the basis of size and whether the High School Characteristics Index had been administered to their senior class. There was no other criteria for matching the schools.

The principals of the six schools were asked to list which innovative practices they used in some phase of their schools during the 1969-70 school year. The innovations and the responses are reported in Table 1.

Selection of Sample

Selection of the sample varied between schools. In the four smaller schools the entire senior class was included in the sample due to the size of the classes. The sample in the two larger schools was done by random selection of homerooms. This selection was done by the local administrators.

Administration of the Attitude Index

The High School Characteristics Index was administered to each student in the sample by teachers in their respective schools. The Index takes about one and one-half hours to complete and is easy to administer. The schools administered the Index in November and December of 1969. In one school, it was necessary to administer the Index again in February, 1970, and April, 1970, in order to secure a larger sample.

Table 1. Selection criteria

Innovations	Innovative Schools			Non-Innovative Schools		
	A	B	C	D	E	F
Flexible Moduler Scheduling	yes	no	yes	no	no	no
Modular Scheduling[a]	yes	yes	yes	no	no	no
Honor Study Halls	no	yes	no	yes	yes	yes
Independent Study[a]	yes	yes	yes	yes	yes	yes
Large Group Instruction[a]	yes	yes	yes	no	no	no
Small Group Instruction[a]	yes	yes	yes	no	no	no
Team Teaching[a]	yes	yes	yes	yes	no	no
Advanced Placement	no	no	no	yes	no	no
Programmed Instruction	yes	yes	yes	no	yes	yes
T.V. Instruction	yes	no	no	no	no	no
Teaching Machines	yes	no	yes	yes	no	no
Open Campus	no	yes	no	no	no	no
Unstructured Free Time	yes	yes	yes	yes	yes	no

[a]Selection Characteristics - An innovative school was defined as one having all five

Table 2 contains the size of the sample in relationship to the size of the graduating class. Although the Index was administered to the entire senior class in four of the schools, several answer sheets were incomplete or incorrectly marked. Therefore, the sample deviates to a degree from the graduating class.

Collection of Other Data

At the completion of the 1969-70 school year, all other data used in the study were collected. The investigator secured (from the records of the students used in the study) the 1969 composite standard score of the Iowa Tests of Educational Development, the most recent intellectual aptitude score, the grade point average of each student, and the class rank of each graduating senior.

The three measures of achievement were collected after the completion of the school year because grade point averages and class rank were not available until this time. Further, since many educators feel the ITED does not test what is being taught today, more than one achievement variable seemed advisable.

The intellectual aptitude test scores were converted to a standard score because several different I.Q. tests had been administered to the students. This was done by converting the I.Q. score to a "z" score and then using the "z" score to compute a "t" score.

Table 2. Sample size

	Innovative Schools			Non-Innovative Schools		
	A	B	C	D	E	F
Size of the Senior Class	586	173	48	410	141	52
Size of Sample	208	157	46	228	135	50

$$z = \frac{X - \bar{X}}{s} \qquad t = 500 + 100z$$

The mean and standard deviation of each of the I.Q. tests and the converted scores are found in appendix A.

Analysis of the Data

The data were coded and placed on IBM cards at the Computation Center at Iowa State University. The coded information was verified. Means and standard deviations were obtained for the variables. A correlation matrix was developed to compare the 14 variables used in the analysis. Significance at the one percent and five percent levels were denoted.

An analysis of variance technique, the "F" test, was selected as an appropriate method for comparing the means of selected variables. The "F" value was tested at the one percent and five percent levels to determine if there was a significant difference in the means.

In situations where there was a significant difference indicated and the variable had more than two levels, a Scheffe's test was used to determine where the difference existed.

FINDINGS

This chapter was devoted to the presentation of the findings. It was divided into four parts: description of the variables, means of the variables, analysis of variance model, and analysis of variance.

Description of the Variables

As reported earlier in this study, the High School Characteristics Index consists of 300 items which can be grouped into 30 scales (Appendix B). The means and variance of each of the schools was run for the 30 scales (Appendix C). A decision was made not to use the scales for the analysis of variance due to the preponderance of data to be analyzed and the computer time it would take. Instead, six factors that could be extracted were used in further analysis. Mitchell (45), using a factor analysis, found that these factors discriminate distinctly between schools. The factors were used as variables of attitude and are as follows:

1. Aspiration Level - This factor consists of the Counteraction-Inferiority Avoidance, Change-Sameness, Fantasied Achievement, and Understanding scales. A high score on this factor would indicate the school encourages the students to set high standards for themselves in a variety of ways, including opportunities for student participation in the decision-making process. It implies that student efforts to

make an impact on his environment have some chance for success. A high aspiration level can also be encouraged by introducing the student to individuals and ideas likely to serve as models of intellectual and professional achievement.

2. Intellectual Climate - The qualities of staff and facilities specifically devoted to scholarly activities in the arts, humanities, and social sciences are reflected in this factor. It consists of the scales of Reflectiveness, Humanities-Social Studies, Sensuality-Puritanism, Understanding, and Fantasied Achievement.

3. Student Dignity - This factor is associated with student freedom and personal responsibility. Schools that regulate student conduct by means other than legislative codes and administrative rules and regulations tend to score higher on this factor. Also, if there is a minimum of coercion and students are generally treated with respect, it will be reflected in the score of this factor. The inverse scale score of Abasement-Assurances and Dominance- Tolerance comprise this factor.

4. Academic Climate - Academic excellence in staff and facilities in the areas of natural sciences, humanities, and social sciences are stressed in this factor. It is made up of the combined scores of the scales of Science and Humanities-Social Studies.

5. Academic Achievement - If the school sets high

standards of achievement for their students, it is reflected in this factor. Achievement, Energy-Passivity, Understanding, Counteraction-Inferiority Avoidance, and Conjunctivity-Disjunctivity are the scales making up this factor.

6. Self-Expression - This factor is concerned with opportunities for the development of leadership potential and self-assurance offered to the student. Curricular and extracurricular activities such as debate, drama, musical activities and projects are some of the ways this can be achieved in the school. This factor consists of the scales of Ego Achievement, Emotional-Placidity, Exhibitionism-Inferiority Avoidance, and Energy-Passivity.

Three variables measuring achievement were used in the study: grade point average, rank in class, and the ITED. Grade point average refers to the student's cumulative average at the completion of the senior year. Rank in class was his relative position in class at the end of his senior year, and the ITED was the composite score on the 1969 Iowa Test of Educational Development.

Tables 3, 4, and 5 contained descriptive data by school.

In Table 3 the percentages of males and females by school were similar with the exception of school F, which had a much larger percentage of males in its sample.

Table 4 indicated the grade point averages by schools. It may be noted that the grade point averages of the smaller

schools were highest while the averages of the medium sized schools were lowest.

In Table 5 the mean composite ITED scores were presented by school. The mean scores for non-innovative schools were higher than the innovative schools in all three levels of size.

Table 3. Number and percentage of students categorized by sex for each school

	Innovative Schools			Non-Innovative Schools		
	A	B	C	D	E	F
Males	96	76	24	109	62	31
Percentage	48.5	49.3	52.2	48.2	45.9	63.3
Females	102	78	22	117	73	18
Percentage	51.5	50.6	47.8	51.8	54.1	36.7
Total	198	154	46	226	135	49

Table 4. The mean and standard deviation of grade point average by schools

	Innovative Schools			Non-Innovative Schools		
	A	B	C	D	E	F
Mean	2.55	2.44	2.60	2.52	2.42	2.70
Standard deviation	.698	.705	.765	.814	.699	.762
Number	208	157	46	228	135	50

Table 5. The mean and standard deviation of composite ITED scores by schools

	Innovative Schools			Non-Innovative Schools		
	A	B	C	D	E	F
Mean	19.24	21.01	19.76	22.50	22.30	21.44
Standard deviation	8.68	6.56	6.27	7.83	5.76	6.36
Number	208	157	46	228	135	50

Four independent variables were used in the study as stated earlier. They were type of school, innovative or non-innovative, size of school, sex, and I.Q.

Table 6. The mean and standard deviation of converted I.Q. scores by school

	Innovative Schools			Non-Innovative Schools		
	A	B	C	D	E	F
Mean	562.07	584.68	553.20	607.49	566.66	570.08
Standard deviation	143.49	105.50	118.27	157.79	87.97	114.28
Number	208	157	46	228	135	50

After analyzing the mean I.Q. by school, Table 6, a decision was made to divide I.Q. into two levels, rather than the three as previously intended. These levels were 580 and above, and below 580.

A correlation matrix was run on all fourteen variables to determine their relationships to one another. Table 7 presented these results. The correlations were tested at the one per cent and five per cent levels. It is interesting to note that the six attitude variables are significantly related to one another at the one per cent level and the three achievement variables are also significantly related to one another at the one per cent level.

After studying the relationship of rank in class to grade point average and ITED results, a decision was made to elimi-

Table 7. Correlation matrix for all variables

Variables	1	2	3
1 - Innovation	1.00000		
2 - Size	0.03819	1.00000	
3 - Sex	-0.01712	-0.02069	1.00000
4 - Aspiration Level	-0.17569**	0.15481**	-0.00821
5 - Intellectual Climate	-0.08841*	0.22220**	-0.00548
6 - Student Dignity	0.01101	0.07501*	-0.00432
7 - Academic Climate	0.02432	0.31715**	0.05672
8 - Academic Achievement	0.02009	0.10513**	-0.01405
9 - Self-Expression	0.03434	0.08124*	-0.03161
10 - GPA	-0.00346	-0.00622	-0.14236**
11 - Rank in Class	-0.08406*	0.59566**	0.11740**
12 - ITED	0.14984**	0.00161	-0.01819
13 - I.Q.	0.07601*	0.06057	-0.06260
14 - I.Q. Group	0.07240*	0.13169**	-0.07435*

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 7 (Continued)

Variables	4	5	6	7
1				
2				
3				
4	1.00000			
5	0.75301**	1.00000		
6	0.34228**	0.39617**	1.00000	
7	0.46776**	0.73297**	0.29534**	1.00000
8	0.68063**	0.68547**	0.52202**	0.52622**
9	0.54306**	0.64230**	0.29545**	0.54805**
10	0.06577	0.04465	0.24016**	-0.05722
11	0.04943	0.09504**	-0.11339**	0.20929**
12	0.00451	-0.02692	0.19459**	-0.10251**
13	-0.01199	-0.03231	0.07157*	-0.07874*
14	-0.02869	-0.00810	0.04606	-0.02621

Table 7 (Continued)

Variables	8	9	10	11
1				
2				
3				
4				
5				
6				
7				
8	1.00000			
9	0.73856**	1.00000		
10	0.07911*	-0.02405	1.00000	
11	-0.02372	0.04301	-0.55913**	1.00000
12	0.02269	-0.09358**	0.64783**	-0.47768**
13	-0.01584	-0.03336	0.45316**	-0.28134**
14	-0.02799	-0.04491	0.48282**	-0.22085**

Table 7 (Continued)

Variables	12	13	14
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12	1.00000		
13	0.54125**	1.00000	
14	0.55984**	0.67815**	1.00000

nate rank in class as a variable. This was done for convenience and because rank in class is a function of grade point average. It eliminated the necessity of converting class rank to a percentile which would be comparable for all schools.

Means of the Variables

Means and standard deviations were run on each of the dependent variables when categorized by each independent variable.

Table 8 indicated the means of the dependent variables when categorized by type of school. It was noted that the means favored the non-innovative schools for all variables except aspiration level, intellectual climate, and grade point average.

Table 9 presented the means of the dependent variables when categorized by school size. These means favored the larger schools for all of the attitude variables. They favored the small schools on grade point average, while the medium sized schools were favored only on ITED composite score.

In Table 10 the means for the dependent variables were presented when categorized by sex. They favored the females on four of the six attitude variables and one of the achievement variables. The males were favored only on academic climate, self-expression, and ITED composite scores.

Table 8. The means and standard deviations of the dependent variables when categorized by type of school

Variables	Type of School	Number	Mean	Standard Deviation
Aspiration Level	Innovative	397	22.055405	3.725045
	Non-Innovative	411	20.603394	4.372645
Intellectual Climate	Innovative	397	24.163727	5.526749
	Non-Innovative	411	23.046219	6.955561
Student Dignity	Innovative	397	17.408051	4.587215
	Non-Innovative	411	17.520676	5.572471
Academic Climate	Innovative	397	8.297229	3.310515
	Non-Innovative	411	8.457426	3.272686
Academic Achievement	Innovative	397	27.163727	6.114432
	Non-Innovative	411	27.430649	7.111685
Self-Expression	Innovative	397	21.050369	5.012075
	Non-Innovative	411	21.420914	5.732938
Grade Point Average	Innovative	397	2.512216	0.714081
	Non-Innovative	411	2.507056	0.774166
ITED Results	Innovative	397	20.062958	7.651648
	Non-Innovative	411	22.289536	7.035628

Table 9. The means and standard deviations of the dependent variables when categorized by size of school

Variables	Size of School	Number	Mean	Standard Deviation
Aspiration Level	Small	95	19.58946	3.56741
	Medium	289	21.21799	4.09967
	Large	424	21.77122	4.16433
Intellectual Climate	Small	95	20.95789	5.30526
	Medium	289	22.61937	5.94909
	Large	424	24.85141	6.47122
Student Dignity	Small	95	16.26315	5.52547
	Medium	289	17.51556	4.91951
	Large	424	17.70047	5.10803
Academic Climate	Small	95	6.25263	2.86529
	Medium	289	7.76124	3.17022
	Large	424	9.27594	3.14460
Academic Achievement	Small	95	24.79999	5.97118
	Medium	289	27.59515	6.54018
	Large	424	27.65800	6.73305
Self-Expression	Small	95	19.82104	5.02831
	Medium	289	21.32526	5.30571
	Large	424	21.49763	5.48369
Grade Point Average	Small	95	2.64463	0.75855
	Medium	289	2.42976	0.70323
	Large	424	2.53375	0.76398

Table 9 (Continued)

Variables	Size of School	Number	Mean	Standard Deviation
ITED Results	Small	95	20.54736	6.28243
	Medium	289	21.59860	6.22517
	Large	424	21.06602	8.34774

Table 10. The means and standard deviations of the dependent variables when categorized by sex

Variables	Sex	Number	Mean	Standard Deviation
Aspiration Level	Female	409	21.50610	4.11817
	Male	399	21.12280	4.13648
Intellectual Climate	Female	409	23.97554	6.58699
	Male	399	23.20551	6.00694
Student Dignity	Female	409	17.57945	5.27432
	Male	399	17.34836	4.93839
Academic Climate	Female	409	8.31296	3.32948
	Male	399	8.44611	3.25237
Academic Achievement	Female	409	27.57701	6.62438
	Male	399	27.01503	6.64759
Self-Expression	Female	409	21.62592	5.52828
	Male	399	20.84210	5.22312
Grade Point Average	Female	409	2.63420	0.71701
	Male	399	2.38185	0.75219
ITED Results	Female	409	21.17114	7.12242
	Male	399	21.22055	7.72987

Table 11. The means and standard deviations of the dependent variables when categorized by I.Q. group

Variables	I.Q. Group	Number	Mean	Standard Deviation
Aspiration Level	Low	337	21.45697	3.95812
	High	471	21.21655	4.24864
Intellectual Climate	Low	337	23.65578	5.55634
	High	471	23.55200	6.81211
Student Dignity	Low	337	17.18694	4.94939
	High	471	17.66454	5.21697
Academic Climate	Low	337	8.48071	3.10553
	High	471	8.30573	3.41782
Academic Achievement	Low	337	27.51929	6.23672
	High	471	27.14224	6.91281
Self-Expression	Low	337	21.52521	4.85889
	High	471	21.03397	5.73763
Grade Point Average	Low	337	2.08415	0.60926
	High	471	2.81399	0.68208
ITED Results	Low	337	16.27893	5.78492
	High	471	24.71336	6.40735

The means for the dependent variables when categorized by I.Q. were presented in Table 11. The lower I.Q. group had more favorable means for five of the six attitude variables, while the higher I.Q. group had the more favorable means for all of the achievement variables.

Analysis of Variance Model

An analysis of variance was used to treat the data in order to analyze the main effects and their interaction. The model that was used to test hypothesis 10 was then reduced to test the other hypotheses in the study. The following is the model that was used for hypothesis 10:

$$Y_{ijklm} = U+A_i+B_j+C_k+D_l+(AB)_{ij}+(AC)_{ik}+(AD)_{il}+(BC)_{jk}+(BD)_{jl}+(CD)_{kl}+(ABC)_{ijk}+(ABD)_{ijl}+(ACD)_{ikl}+(BCD)_{jkl}+(ABCD)_{ijkl}+E_{ijklm}$$

where each letter is as defined below:

Y_{ijklm} = the mth observation (attitude factor score) of the (ijkl)th treatment combination (school type, school size, sex, and intellectual aptitude)

U = grand mean

A_i = the true effect of the ith level of school type

B_j = the true effect of the jth level of school size

C_k = the true effect of the kth level of sex

D_l = the true effect of the lth level of intellectual aptitude

$(AB)_{ij}$ = the true effect of the interaction of the ith level of school type and the jth level of school size

$(AC)_{ik}$ = the true effect of the interaction of the ith level of school type and the kth level of sex

$(AD)_{il}$ = the true effect of the interaction of the ith level of school type and the lth level of intellectual aptitude

$(BC)_{jk}$ = the true effect of the interaction of the jth level of school size and the kth level of sex

$(BD)_{jl}$ = the true effect of the interaction of the jth level of school size and the lth level of intellectual aptitude

$(CD)_{kl}$ = the true effect of the interaction of the kth level of sex and the lth level of intellectual aptitude

$(ABC)_{ijk}$ = the true effect of the interaction of the ith level of school type, the jth level of school size, and the kth level of sex

$(ABD)_{ijl}$ = the true effect of the interaction of the ith level of school type, the jth level of school size, and the lth level of intellectual aptitude

$(ACD)_{ikl}$ = the true effect of the interaction of the ith level of school type, the kth level of sex, and

the lth level of intellectual aptitude

$(BCD)_{jkl}$ = the true effect of the interaction of the jth level of school size, the kth level of sex, and the lth level of intellectual aptitude

$(ABCD)_{ijkl}$ = the true effect of the interaction of the ith level of school type, the jth level of school size, the kth level of sex, and the lth level of intellectual aptitude

E_{ijklm} = random error of the mth observation of the (ijkl)th treatment combination

$i = 1, 2$

$j = 1, 2, 3$

$k = 1, 2$

$l = 1, 2$

$m = 1, 2, 3, 4, 5, 6$

In hypothesis 18 the same model was used but the Y_{ijklm} term was defined for achievement factors rather than attitude factor scores.

To test hypotheses 7, 8, 9, 15, 16, and 17 the model was reduced to:

$$Y_{ijkl} = U+A_i+B_j+C_k+(AB)_{ij}+(AC)_{ik}+(BC)_{jk}+(ABC)_{ijk}+E_{ijkl}$$

The letters were defined accordingly.

To test hypotheses 4, 5, 6, 12, 13, and 14 the model was reduced to:

$$Y_{ijk} = U+A_i+B_j+(AB)_{ij}+E_{ijk}$$

and the letters were redefined.

In hypotheses 1 and 11 the model was reduced to:

$$Y_{ij} = U+A_i+E_{ij}$$

and the letters were redefined again.

After analyzing the data it was necessary to eliminate hypotheses 2 and 3. In two of the schools in the sample, the teachers refused to take the HSCI. Therefore, it was impossible to gather sufficient data to test hypotheses 2 and 3.

A Scheffe (61) test of significance was used to determine where there was a difference in means between the levels of school size if a significant difference was indicated in the ANOV. This variable was the only variable to have more than two levels. The equation that was used to find an "F" value between levels was as follows:

$$F_{(k-1)(N-k)} = \frac{(\bar{X}_1-\bar{X}_2)^2}{MS_w\left(\frac{1}{n_1}+\frac{1}{n_2}\right)(k-1)}$$

where

$\bar{X}_1, \bar{X}_2$ = the means to be tested

MS_w = the mean square within

n_1, n_2 = the number in each group

k = the number of levels of the variable

N = the total sample size

Analysis of Variance

Null Hypothesis 1

There is no significant difference in attitude as measured by an attitude scale between students in innovative schools and students in non-innovative schools.

Findings were presented in Tables 12, 13, 14, 15, 16, and 17. In Table 12 the calculated F value was 25.675. This value exceeded the tabular F value of 6.67 at the one per cent level. This result indicated that there were significant differences in aspiration level between types of schools. This difference favored the innovative schools. The null hypothesis was rejected.

Table 13 indicated an F value of 6.352 which is larger than the tabular F value of 3.85 at the five per cent level. This indicated a difference in intellectual climate between types of schools in this study. The difference again favored the innovative schools. The null hypothesis was rejected.

The values of F were not significant for the remaining four attitude variables. Thus, the null hypothesis failed to be rejected for the categories of student dignity, academic climate, academic achievement, and self-expression.

Table 12. Analysis of variance of aspiration level by type of school

Source of variation	df	Sums of squares	Mean squares	F
Between	1	425.813	425.813	25.675**
Within	807	13367.188	16.585	

** Significant at or beyond the one per cent level

Table 13. Analysis of variance of intellectual climate by type of school

Source of variation	df	Sums of squares	Mean squares	F
Between	1	252.250	252.250	6.352*
Within	807	32010.500	39.715	

* Significant at or beyond the five per cent level

Table 14. Analysis of variance of student dignity by type of school

Source of variation	df	Sums of squares	Mean squares	F
Between	1	2.500	2.500	0.095
Within	807	21116.563	26.199	

Table 15. Analysis of variance of academic climate by type of school

Source of variation	df	Sums of squares	Mean squares	F
Between	1	5.184	5.184	0.477
Within	807	8752.938	10.860	

Table 16. Analysis of variance of academic achievement by type of school

Source of variation	df	Sums of squares	Mean squares	F
Between	1	14.625	14.625	0.331
Within	807	35629.188	44.205	

Table 17. Analysis of variance of self-expression by type of school

Source of variation	df	Sums of squares	Mean squares	F
Between	1	27.750	27.750	0.953
Within	807	23481.250	29.133	

Null Hypothesis 2

There is no significant correlation between the attitudes of students and the attitudes of faculty members in either innovative or non-innovative schools.

This null hypothesis was not tested due to insufficient data.

Null Hypothesis 3

There is no significant difference in attitude between instructors in innovative and non-innovative schools.

This null hypothesis was not tested due to insufficient data.

Null Hypothesis 4

There is no significant difference in attitude as measured by the High School Characteristics Index (HSCI) between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex.

The results of the analysis of variance were presented in Tables 18, 19, 20, 21, 22, and 23.

In Table 18 the F value of 26.979 exceeded the tabular F value of 6.67 at the one per cent level for the main effect innovation. This difference favored the innovative schools. The null hypothesis was rejected for the main effect innovation on aspiration level. It was not rejected for the other main effect or the interaction.

Table 19 indicated an F value of 5.721 for the main effect innovation. This was larger than the tabular F of 3.85 at the five per cent level. Again, the difference favored the innovative schools. The null hypothesis was rejected on intellectual climate for the main effect innovation. It was not rejected for the other main effect or for the interaction.

There were no significant F values indicated in Tables 20, 21, and 22. Therefore, the null hypothesis was not rejected for the categories of student dignity, academic climate, and academic achievement.

Table 23 presented an F value for the main effect sex of 4.473. This exceeded the tabular F of 3.85 at the five per cent level. The difference indicated on self-expression favored the males. The null hypothesis was rejected for the main effect sex on self-expression. It was not rejected for innovation or the interaction of innovation and sex.

Table 18. Analysis of variance of aspiration level by type of school and sex of students

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	414.875	414.875	26.979**
Sex	1	32.750	32.750	1.974
Innovation x sex	1	0.000	0.000	0.000
Error	801	13286.000	16.587	

** Significant at or beyond the one per cent level

Table 19. Analysis of variance of intellectual climate by type of school and sex of students

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	225.125	225.125	5.721*
Sex	1	125.000	125.000	3.177
Innovation x sex	1	13.188	13.188	0.335
Error	801	31520.063	39.351	

* Significant at or beyond the five per cent level

Table 20. Analysis of variance of student dignity by type of school and sex of students

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	2.750	2.750	0.079
Sex	1	12.875	12.875	0.490
Innovation x sex	1	8.188	8.188	0.311
Error	801	21067.875	26.302	

Table 21. Analysis of variance of academic climate by type of school and sex of students

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	6.691	6.691	0.618
Sex	1	2.934	2.934	0.271
Innovation x sex	1	2.883	2.883	0.266
Error	801	8673.449	10.828	

Table 22. Analysis of variance of academic achievement by type of school and sex of students

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	17.000	17.000	0.385
Sex	1	72.375	72.375	1.638
Innovation x sex	1	59.813	59.813	1.354
Error	801	35391.188	44.184	

Table 23. Analysis of variance of self-expression by type of school and sex of students

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	33.625	33.625	1.160
Sex	1	129.688	129.688	4.473*
Innovation x sex	1	7.625	7.625	0.263
Error	801	23224.688	28.995	

* Significant at or beyond the five per cent level

Null Hypothesis 5

There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of intellectual aptitude.

Tables 24, 25, 26, 27, 28, and 29 presented the results of the analysis of variance.

In Table 24 an F value of 7.578 was indicated for the main effect innovation. It was larger than the tabular value of 6.67 at the one per cent level. The indicated difference favored the innovative schools. The null hypothesis was rejected for the main effect innovation on aspiration level. It was not rejected for the other main effect or interaction.

The null hypothesis was not rejected for the other five factors of attitude since the F values were less than the tabular value at both the five per cent and one per cent level.

Table 24. Analysis of variance of aspiration level by type of school and I.Q. of students

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	125.886	125.886	7.578**
I.Q.	1	0.252	0.252	0.015
Innovation x I.Q.	1	6.789	6.789	0.409
Error	804	13356.810	16.613	

** Significant at or beyond the one per cent level

Table 25. Analysis of variance of intellectual climate by type of school and I.Q. of students

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	133.884	133.884	3.363
I.Q.	1	2.145	2.145	0.054
Innovation x I.Q.	1	3.137	3.137	0.079
Error	804	32007.249	39.810	

Table 26. Analysis of variance of student dignity by type of school and I.Q. of students

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	1.353	1.353	0.052
I.Q.	1	25.870	25.870	0.987
Innovation x I.Q.	1	0.333	0.333	0.013
Error	804	21072.636	26.210	

Table 27. Analysis of variance of academic climate by type of school and I.Q. of students

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	1.083	1.083	0.100
I.Q.	1	5.612	5.612	0.516
Innovation x I.Q.	1	0.518	0.518	0.048
Error	804	8745.528	10.878	

Table 28. Analysis of variance of academic achievement by type of school and I.Q. of students

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	14.171	14.171	0.320
I.Q.	1	8.862	8.862	0.200
Innovation x I.Q.	1	1.926	1.926	0.044
Error	804	35596.139	44.274	

Table 29. Analysis of variance of self-expression by type of school and I.Q. of students

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	16.805	16.805	0.577
I.Q.	1	23.351	23.351	0.801
Innovation x I.Q.	1	0.229	0.229	0.008
Error	804	23427.862	29.139	

Null Hypothesis 6

There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of school size.

Tables 30, 31, 32, 33, 34, and 35 presented the results of the analysis of variance.

Table 30 indicated significant differences for both main effects. The calculated F for innovation was 16.065, and for size it was 11.232. Both of these values were significant at the one per cent level.

To determine where the difference was on school size, a Scheffe test was run. The F value for the comparison between small and medium sized schools was 5.896**. This F exceeded the tabular F at the one per cent level. The F value for the comparison between the medium and large sized schools was 1.635 which was not significant. Therefore, the differences existed between the small and medium sized schools, and the small and large sized schools. These differences favored the medium and large sized schools.

The null hypothesis was rejected for the main effects innovation and size on aspiration level.

In Table 31, both of the main effects indicated significant differences. The F value for innovation was significant at the five per cent level, and the F value for size

was significant at the one per cent level. The differences in innovation favored the innovative schools.

Comparisons were made on the different levels of school size. An F value of 2.614 was found for the comparison between small and medium sized schools. The F value comparing medium and large sized schools was 11.341**. This was significant at the one per cent level. Therefore, significant differences existed between small and large sized schools, and medium and large sized schools. In each case the difference favored the large sized schools.

The null hypothesis was rejected for the main effects innovation and size on intellectual climate.

In Table 32, significant differences were found for both main effects and their interaction. The difference was significant at the five per cent level for innovation and favored the non-innovative schools. The differences were significant at the one per cent level for both size and the interaction of innovation and size.

In comparing levels of size, an F value of 2.195 was found for small and medium sized schools which was not significant. An F value of 1.150 was found for medium and large sized schools. This, too, was not significant. Therefore, the difference that existed was between the small and large sized schools, and favored the large sized schools.

Since a significant interaction was discovered, further

investigation seemed necessary. Figure 1 indicated the interaction was due to the difference of the middle sized schools. The means for large and small sized schools favored the innovative schools, but the difference between medium sized schools favored the non-innovative schools. The significance of the main effects must be considered in the light of this interaction.

The null hypothesis was rejected for both main effects and interaction on student dignity.

Table 33 indicated F values for innovation, size, and their interaction which exceeded the tabular F value at the one per cent level for all three tests. The difference in innovation favored the non-innovative schools.

Comparison of the levels of size produced an F value of 8.614** for small and medium sized schools, and an F of 20.87** for medium and large sized schools. Both of these values were significant at the one per cent level. Therefore, differences existed between all three levels of size. The difference between the small and medium sized schools favored the medium sized schools. The differences between the medium sized schools and large sized schools, and the small sized schools and large sized schools favored the large sized schools in both instances.

Figure 2 presented the comparison of means of the interaction. The interaction was due to the difference between the

large sized schools. Because of the significant interaction, the significance of the main effects must be considered in light of the interaction.

The null hypothesis was rejected for innovation, size, and their interaction on academic climate.

The null hypothesis was not rejected on academic achievement since there were no significant differences indicated in Table 34.

Table 35 indicated no significant differences for main effects, but there was a significant interaction at the five per cent level for innovation and size. This interaction was investigated further in Figure 3. It was found that the interaction was due to the difference in the small schools.

The null hypothesis was rejected for the interaction of innovation and size on self-expression. It was not rejected for the main effects.

Table 30. Analysis of variance of aspiration level by type of school and size of school

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	258.346	258.346	16.065**
Size	2	361.254	180.627	11.232**
Innovation x size	2	78.953	39.477	2.455
Error	802	12897.462	16.082	

** Significant at or beyond the one per cent level

Table 31. Analysis of variance of intellectual climate by type of school and size of school

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	178.662	178.662	4.733*
Size	2	992.701	496.350	13.149**
Innovation x size	2	73.334	36.667	0.971
Error	802	30273.967	37.748	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 32. Analysis of variance of student dignity by type of school and size of school

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	132.035	132.035	5.169*
Size	2	310.938	155.469	6.087**
Innovation x size	2	470.468	235.234	9.210**
Error	802	20484.795	25.542	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 33. Analysis of variance of academic climate by type of school and size of school

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	122.442	122.442	12.963**
Size	2	1011.805	505.902	53.560**
Innovation x size	2	300.619	150.310	15.914**
Error	802	7575.251	9.445	

** Significant at or beyond the one per cent level

Table 34. Analysis of variance of academic achievement by type of school and size of school

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	0.203	0.203	0.005
Size	2	152.264	76.132	1.755
Innovation x size	2	161.616	80.808	1.863
Error	802	34793.544	43.383	

Table 35. Analysis of variance of self-expression by type of school and size of school

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	46.506	46.506	1.621
Size	2	6.026	3.013	0.105
Innovation x size	2	243.302	121.651	4.239*
Error	802	23016.931	28.699	

* Significant at or beyond the five per cent level

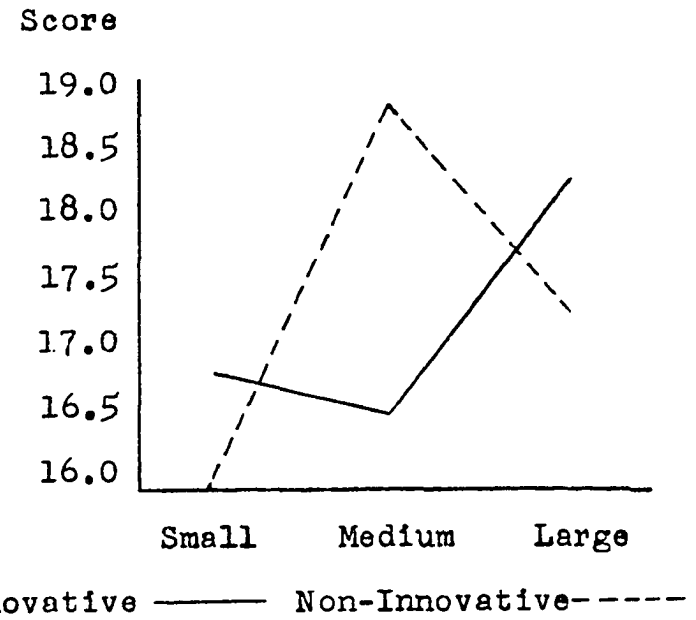


Figure 1. Interaction of innovation and size on student dignity

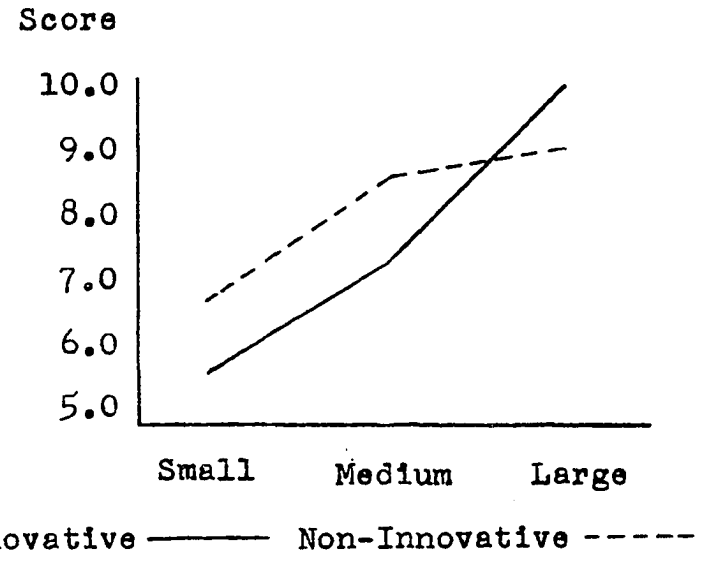


Figure 2. Interaction of innovation and size on academic climate

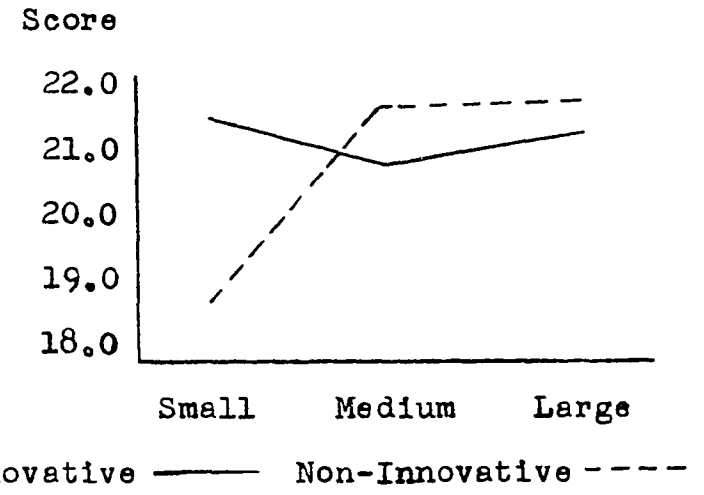


Figure 3. Interaction of innovation and size on self-expression

Null Hypothesis 7

There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex and school size.

Tables 36, 37, 38, 39, 40, and 41 presented the results of the analysis of variance.

In Table 36 significant differences were reported for the main effects of innovation and size at the one per cent level. There were also significant F values for the interactions of size and sex; and innovation, size, and sex. The interactions were significant at the five per cent level. The other main effect and interactions were not significant.

The difference in innovation favored the innovative schools.

A comparison of the levels of size indicated F values of 5.913** for small and medium sized schools, and 1.640 for medium and large sized schools. The comparison between the small and medium sized schools was significant at the one per cent level. This indicated differences existed between the small and large sized schools, and the small and medium sized schools. In each case, the difference favored the larger of the schools in the comparison.

Figure 4 presented the results of the interaction of size and sex. It was found the interaction occurred between sexes

in the large sized schools.

Figure 5 presented the interaction of innovation, size, and sex. There was an inversion of scores between sexes in the large sized, non-innovative schools and between sexes in the medium sized, innovative schools. The significant main effects must be considered in the light of these interactions.

The null hypothesis was rejected for the main effects innovation and size; for the interaction of size and sex; and the interaction of innovation, size, and sex on aspiration level.

Table 37 indicated significant F values for size, and the interaction of size and sex on intellectual climate at the one per cent level. No other main effects or interactions were significant.

A comparison of means for the levels of size revealed F values of 2.628 for small and medium sized schools, and 11.398** for medium and large sized schools. The comparison between the medium and large sized schools was significant at the one per cent levels. Therefore, difference existed between the large and small sized schools, and between the large and medium sized schools. In each case this difference favored the large sized schools.

Figure 6 indicated the interaction between size and sex was due to the inversion of scores of the sexes in the large sized schools. The significant main effect must be consid-

ered in relation to this interaction.

The null hypothesis was rejected for the main effect size, and the interaction of size and sex on intellectual climate.

In Table 38 none of the main effects were significant, while two of the two-way interactions were significant. The interaction of innovation and size, and the interaction of size and sex were significant at the one per cent level.

Figures 7 and 8 graphically represented the interactions. In Figure 7 the interaction of innovation and size occurred in the medium sized schools. In Figure 8 the interaction was due to the inversion of scores by sex in the medium sized schools.

The null hypothesis was rejected for the interaction of innovation and size, and the interaction of size and sex on student dignity.

Table 39 indicated significant differences for the main effect size at the one per cent level, and the main effect sex at the five per cent level. There was also a significant F value for the interaction of innovation and size at the one per cent level. None of the other main effects or the other interactions were significant.

The comparison between levels of size indicated a significant F value of 8.75** for small and medium sized schools favoring the medium sized schools, and a significant F

value of 28.580** for medium and large sized schools favoring the large sized schools. Therefore, differences appeared to exist between all three levels of size.

The differences in sex favored the males. They scored higher than the females on academic climate.

Figure 9 gave the graphic representation of the interaction of innovation and size. The interaction was due to the variation of scores in the large sized schools.

The null hypothesis was rejected for size, sex, and the interaction of innovation and size on academic achievement.

Table 40 reported significant F values for size at the one per cent level, and the interaction of innovation and sex at the five per cent level. The other main effects and interactions were not significant.

The Scheffe test yielded an F value of 6.54** between small and medium sized schools. This was significant at the one per cent level. The comparison of the medium and large sized schools yielded an F value of .008 which was not significant. Therefore, the differences appeared to exist between the small and medium sized schools, and between the small and large sized schools. In each case they favored the larger of the two schools in the comparison.

Figure 10 indicated the significant interaction of innovation and sex was due to the inversion of scores between the sexes.

The null hypothesis was rejected for the main effect size, and for the interaction of innovation and sex on academic achievement.

Table 41 showed significant difference for the main effect size; the two-way interactions of innovation and size, and of innovation and sex; and the three-way interaction of innovation, size, and sex. The remaining main effects and interactions were not significant.

The comparisons of the levels of the main effect size yielded F values of 2.860 for small and medium sized schools, and .090 for medium and large sized schools. Neither of these values was significant. The indicated difference in school size lay between the small and large sized schools, and favored the large sized schools.

Figure 11 presented the interaction of innovation and size in graph form. The interaction occurred between the small sized schools. Their scores were inverted in relation to the other levels of school size.

Figure 12 showed the interaction of innovation and sex. The lines tended to cross as there was greater variance in scores of the males than of scores of the females.

Figure 13 indicated the interaction of innovation, size, and sex was due to the inversion of scores by sex in the large sized, non-innovative schools.

The null hypothesis was rejected for the main effect

size; the interaction of innovation and size; the interaction of innovation and sex; and the interaction of innovation, size, and sex on self-expression.

Table 36. Analysis of variance of aspiration level by type of school, size of school, and sex

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	196.750	196.750	12.271**
Size	2	436.875	218.438	13.623**
Sex	1	2.938	2.938	0.183
Innovation x size	2	48.938	24.469	1.526
Innovation x sex	1	35.063	35.063	2.187
Size x sex	2	205.125	102.563	6.396*
Innovation x size x sex	2	103.625	51.813	3.231*
Error	796	12763.688	16.035	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 37. Analysis of variance of intellectual climate by type of school, size of school, and sex

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	124.938	124.938	3.327
Size	2	1678.188	839.094	22.342**
Sex	1	0.625	0.625	0.017
Innovation x size	2	50.500	25.250	0.672
Innovation x sex	1	5.875	5.875	0.156
Size x sex	2	350.750	175.375	4.670**
Innovation x size x sex	2	156.500	78.250	2.083
Error	796	29895.375	37.557	

** Significant at or beyond the one per cent level

Table 38. Analysis of variance of student dignity by type of school, size of school, and sex

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	5.000	5.000	0.197
Size	2	150.188	75.094	2.962
Sex	1	0.000	0.000	0.000
Innovation x size	2	482.063	241.031	9.509**
Innovation x sex	1	2.000	2.000	0.079
Size x sex	2	284.063	142.031	5.603**
Innovation x size x sex	2	18.500	9.250	0.365
Error	796	20177.250	25.348	

** Significant at or beyond the one per cent level

Table 39. Analysis of variance of academic climate by type of school, size of school, and sex

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	26.527	26.527	2.854
Size	2	907.246	453.623	48.807**
Sex	1	40.559	40.559	4.364*
Innovation x size	2	305.238	305.238	16.421**
Innovation x sex	1	0.395	0.395	0.042
Size x sex	2	48.965	24.482	2.634
Innovation x size x sex	2	30.895	15.447	1.662
Error	796	7398.297	9.294	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 40. Analysis of variance of academic achievement by type of school, size of school, and sex

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	12.250	12.250	0.287
Size	2	778.375	389.188	9.122**
Sex	1	5.875	5.875	0.138
Innovation x size	2	230.250	115.125	2.698
Innovation x sex	1	233.438	233.438	5.471*
Size x sex	2	248.125	124.063	2.908
Innovation x size x sex	2	174.563	87.281	2.046
Error	796	33960.938	42.664	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 41. Analysis of variance of self-expression by type of school, size of school, and sex

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	34.188	34.188	1.210
Size	2	253.313	126.656	4.484*
Sex	1	4.000	4.000	0.142
Innovation x size	2	308.688	154.344	5.464**
Innovation x sex	1	112.625	112.625	3.987*
Size x sex	2	139.813	69.906	2.475
Innovation x size x sex	2	171.563	85.781	3.037*
Error	796	22484.813	28.247	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

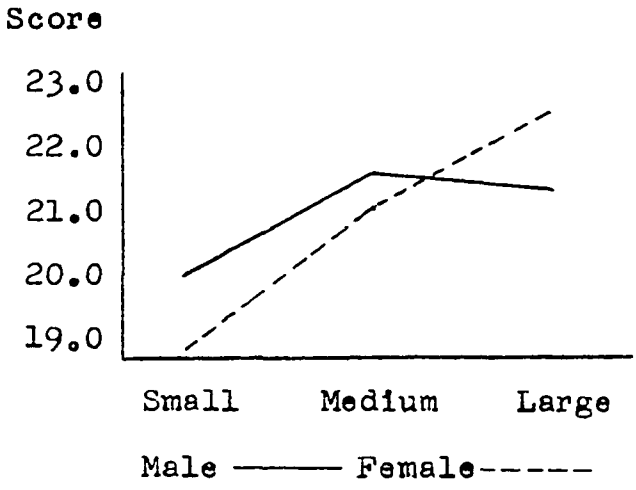


Figure 4. Interaction of size and sex on aspiration level

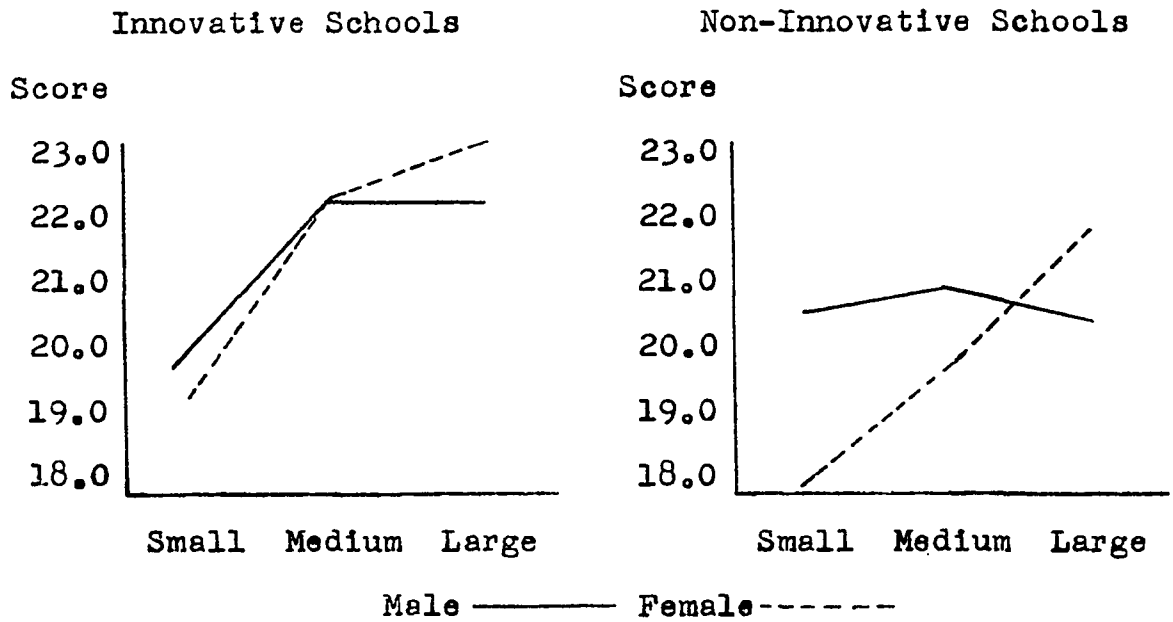


Figure 5. Interaction of innovation, size, and sex on aspiration level

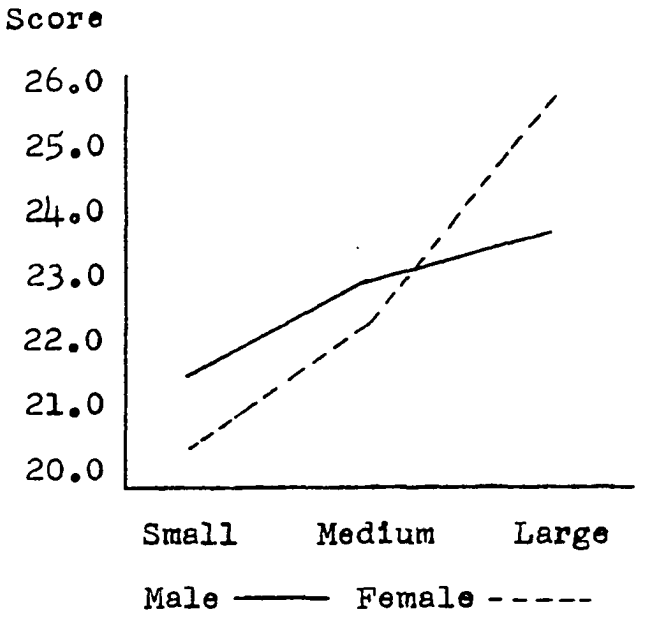


Figure 6. Interaction of size and sex on intellectual climate

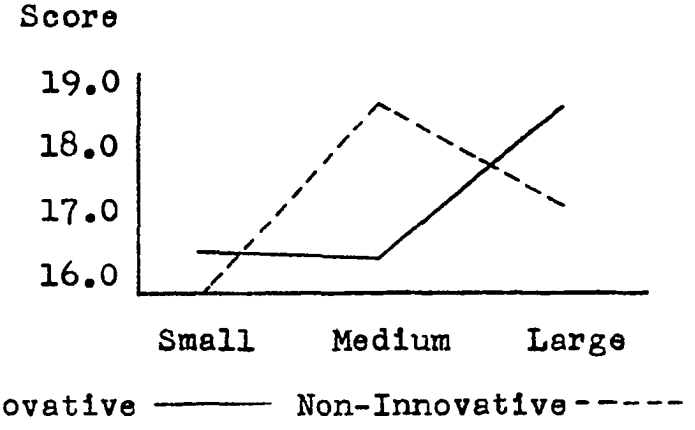


Figure 7. Interaction of innovation and size on student dignity

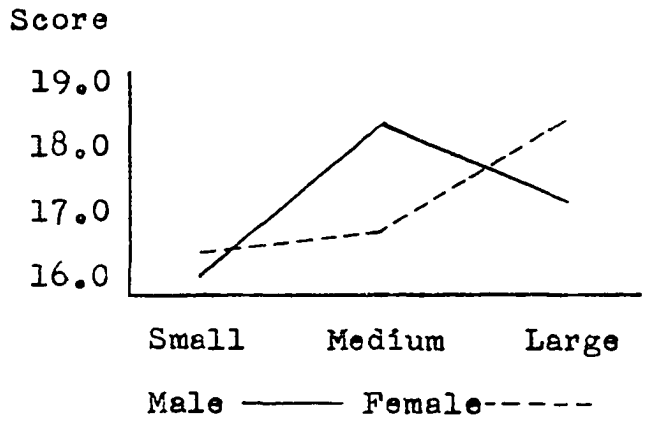


Figure 8. Interaction of size and sex on student dignity

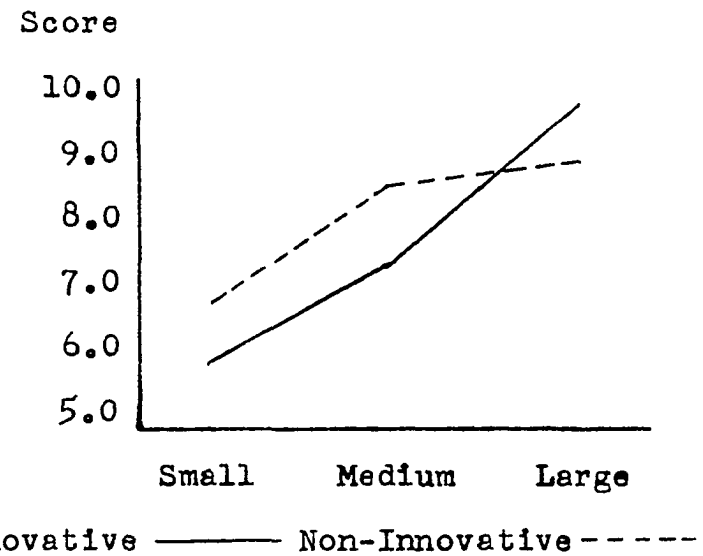


Figure 9. Interaction of innovation and size on academic achievement

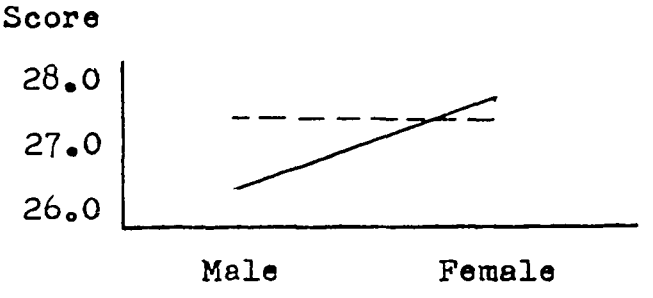


Figure 10. Interaction of innovation and sex on academic achievement

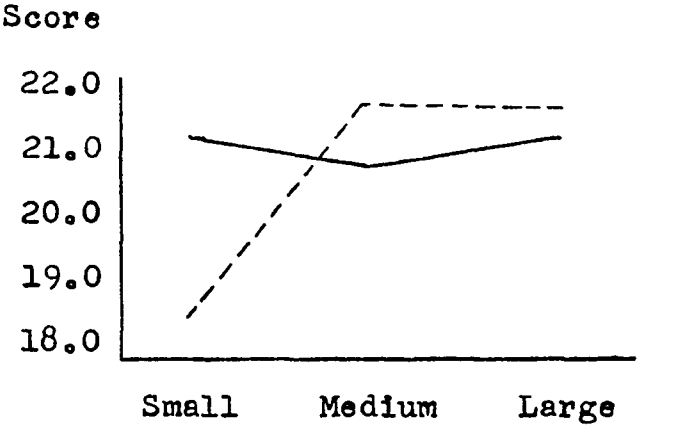


Figure 11. Interaction of innovation and size on self-expression

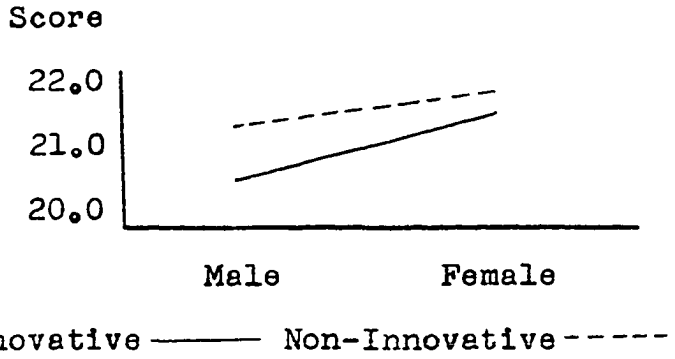


Figure 12. Interaction of innovation and sex on self-expression

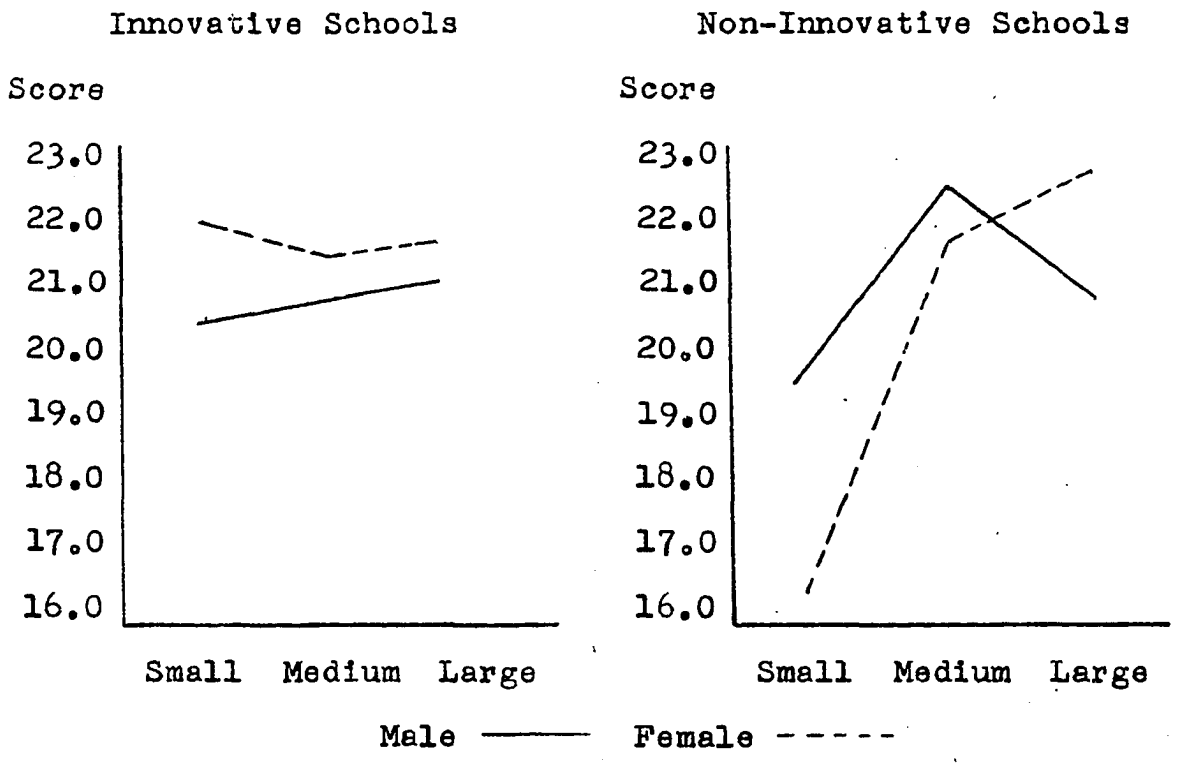


Figure 13. Interaction of innovation, size, and sex on self-expression

Null Hypothesis 8

There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex and intellectual aptitude.

Tables 42, 43, 44, 45, 46, and 47 presented the results of the analysis of variance.

In Table 42 an F value of 22.897 was indicated for the main effect innovation. This was significant at the one per cent level. The reported difference favored the innovative schools. The other main effects and interactions were not significant. The null hypothesis was rejected for innovation on aspiration level.

The main effect innovation yielded an F value of 5.819 in Table 43. This was significant at the five per cent level and favored the innovative schools. The other main effects and interactions were not significant. The null hypothesis was rejected for the main effect innovation on intellectual climate.

The null hypothesis was not rejected for the main effects and interactions on student dignity and academic climate as there were no significant differences indicated in Tables 44 and 45.

In Table 46 significant differences were indicated for the main effect sex at the five per cent level; and the

three-way interaction of innovation, sex, and I.Q. at the five per cent level. The other main effects and interactions were not significant. The difference in sex favored the females. Further investigation of the interaction revealed an inversion of table characteristics. High I.Q. males scored higher than low I.Q. males in innovative schools. Low I.Q. females scored higher than high I.Q. females in the innovative schools. This comparison was reversed in the non-innovative schools. These findings were presented graphically in Figure 14. The significance of the main effect sex should be considered in light of the interaction.

The null hypothesis was rejected for the main effect sex and the interaction of innovation, sex, and I.Q. on academic achievement.

In Table 47 a significant difference was indicated for the main effect sex at the five per cent level. There were no significant differences reported for the remaining main effects or the interactions. The difference in sex favored the females.

The null hypothesis was rejected for the main effect sex on self-expression.

Table 42. Analysis of variance of aspiration level by type of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	382.438	382.438	22.897**
Sex	1	32.250	32.250	1.931
I.Q.	1	5.250	5.250	0.314
Innovation x sex	1	0.000	0.000	0.000
Innovation x I.Q.	1	6.000	6.000	0.359
Sex x I.Q.	1	0.250	0.250	0.015
Innovation x sex x I.Q.	1	4.875	4.875	0.292
Error	800	13361.938	16.702	

** Significant at or beyond the one per cent level

Table 43. Analysis of variance of intellectual climate by type of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	230.875	230.875	5.819*
Sex	1	133.875	133.875	3.374
I.Q.	1	0.563	0.563	0.001
Innovation x sex	1	37.188	37.188	0.937
Innovation x I.Q.	1	2.938	2.938	0.074
Sex x I.Q.	1	0.000	0.000	0.000
Innovation x sex x I.Q.	1	114.750	114.750	2.892
Error	800	31742.563	39.678	

* Significant at or beyond the five per cent level

Table 44. Analysis of variance of student dignity by type of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	2.313	2.313	0.088
Sex	1	7.125	7.125	0.271
I.Q.	1	39.938	39.938	1.518
Innovation x sex	1	5.063	5.063	0.192
Innovation x I.Q.	1	0.125	0.125	0.005
Sex x I.Q.	1	5.875	5.875	0.223
Innovation x sex x I.Q.	1	8.750	8.750	0.333
Error	800	21049.875	26.312	

Table 45. Analysis of variance of academic climate by type of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	8.023	8.023	0.740
Sex	1	4.531	4.531	0.418
I.Q.	1	5.867	5.867	0.541
Innovation x sex	1	6.434	6.434	0.594
Innovation x I.Q.	1	0.270	0.270	0.025
Sex x I.Q.	1	26.645	26.645	2.459
Innovation x sex x I.Q.	1	37.516	37.516	3.462
Error	800	8668.836	10.836	

Table 46. Analysis of variance of academic achievement by type of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	23.250	23.250	1.210
Sex	1	84.625	84.625	4.402*
I.Q.	1	39.875	39.875	2.074
Innovation x sex	1	34.375	34.375	1.788
Innovation x I.Q.	1	0.000	0.000	0.000
Sex x I.Q.	1	1.875	1.875	0.010
Innovation x sex x I.Q.	1	81.813	81.813	4.256*
Error	800	15378.000	19.223	

* Significant at or beyond the five per cent level

Table 47. Analysis of variance of self-expression by type of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	39.750	39.750	1.373
Sex	1	156.375	156.375	5.402*
I.Q.	1	65.500	65.500	2.263
Innovation x sex	1	0.688	0.688	0.024
Innovation x I.Q.	1	0.000	0.000	0.000
Sex x I.Q.	1	5.375	5.375	0.186
Innovation x sex x I.Q.	1	82.000	82.000	2.833
Error	800	23159.313	28.949	

* Significant at or beyond the five per cent level

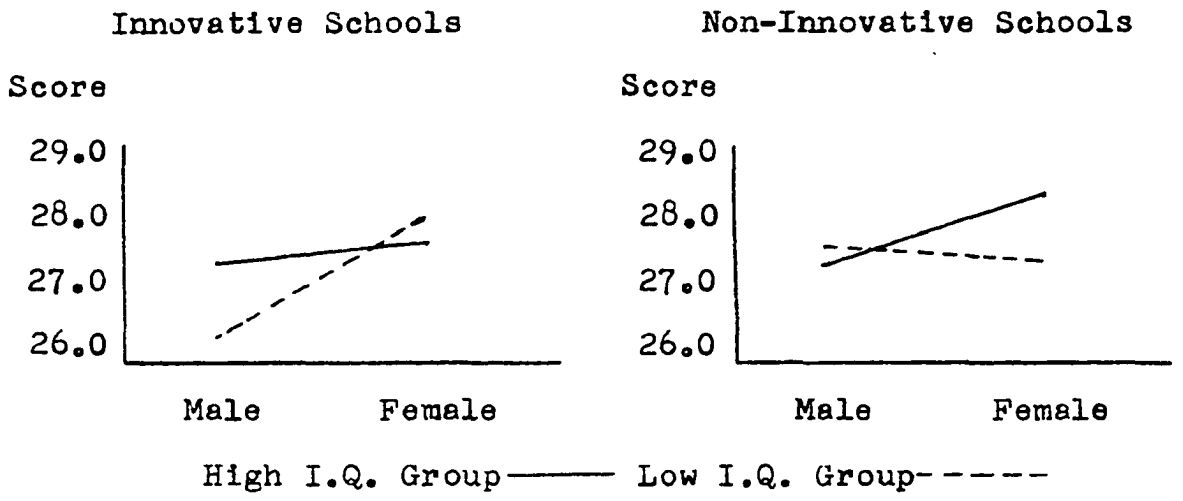


Figure 14. Interaction of innovation, sex, and I.Q. on academic achievement

Null Hypothesis 9

There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of size and intellectual aptitude.

Tables 48, 49, 50, 51, 52, and 53 presented the results of the analysis of variance.

In Table 48 significant differences were reported at the one per cent level for the main effects innovation and size, and the two-way interaction size and I.Q. The remaining main effect and interactions were not significant. The significance of the main effects must be considered in light of the interaction. The difference in innovation favored the innovative schools.

The comparison of levels of school size revealed a significant F of 5.81**, for small and medium sized schools, at the one per cent level. The F value of 1.613 was not significant for the comparison between medium and large sized schools. Therefore, the difference existed between small and large sized schools. The difference favored the larger of the two schools in each comparison.

Figure 15 presented the comparison of means for the interaction of size and I.Q. It revealed that the interaction occurred in the large schools.

The null hypothesis was rejected for the main effects

innovation and size, and for the interaction of size and I.Q. on aspiration level.

Table 49 showed significant differences at the one per cent level for the main effect size, and the interaction of size and I.Q. The other main effects and interactions were not significant.

A comparison of the levels of size produced F values of 2.620 for small and medium sized schools, and 11.365** for medium and large sized schools. The comparison for medium and large sized schools was significant at the one per cent level. Therefore, significant differences existed between small and large sized schools, and medium and large sized schools. In each case the difference favored the large sized schools.

Figure 16 presented the means of the interaction. The interaction was due to the scores of the students with low I.Q.'s in the medium sized schools. Because of this interaction the significance of the main effect must be considered accordingly.

The null hypothesis was rejected for the main effect size, and the interaction of size and I.Q. on intellectual climate.

Table 50 indicated a significant main effect size, and a significant interaction of innovation and size. None of the other main effects or other interactions were signifi-

cant.

Comparing the levels of size, the Scheffe test yielded F values of 2.22 for small and medium sized schools, and 1.06 for medium and large sized schools. Neither of these values were significant. Therefore, the difference existed between the small and large sized schools.

In investigating the interaction further, it appeared, as presented in Figure 17, the difference was due to the variance of scores in the medium sized schools. Their means were inverted in relation to the small and large sized schools.

The null hypothesis was rejected for the interaction of innovation and size on student dignity.

In Table 51 the analysis of variance on academic climate was presented. Significant F values were indicated for the main effect size, the interaction of innovation and size, and the interaction of size and I.Q. The other main effects and interactions were not significant.

A comparison of the levels of size revealed significant F values for all three levels of size at the one per cent level. The F value for small and medium sized schools was 8.637**, and for medium and large sized schools it was 20.928**. The differences favored the large sized school over both the small and medium sized schools. The medium sized school was favored over the small sized school. These

differences must be considered in light of the significant interaction.

Figure 18 presented the interaction of innovation and size, and Figure 19 presented the interaction of size and I.Q. The comparison of innovation and size revealed the interaction occurred between the large sized schools. Figure 19 revealed the interaction occurred between the large sized schools.

The null hypothesis was rejected for the main effect size; and the interactions of innovation and size, and size and I.Q. on academic achievement.

Table 52 showed a significant main effect of size, and a significant interaction between size and I.Q. at the five per cent level. There were no other significant main effects or interactions.

A Scheffe test yielded F values of 6.48** between small and medium sized schools, and 0.01 between medium and large sized schools. The comparison between small and medium sized schools was significant at the one per cent level. Thus, the differences existed between the small and large sized schools, and between the small and medium sized schools. In each case the difference favored the larger of the two schools in the comparison.

A comparison of the means of the interaction was presented in Figure 20. It was revealed the interaction

occurred in the large schools due to an inversion of scores of the students of high I.Q.

The null hypothesis was rejected for the interaction of size and I.Q. on academic achievement.

Table 53 presented significant F values at the five per cent level for the main effects size and I.Q., and the interaction of innovation and size. No other main effects or interactions were significant. The difference in I.Q. favored the females.

The Scheffe test indicated the differences between small and medium sized schools, 2.85; and between medium and large sized schools, .08, were not significant. The difference was between the small and large sized schools as indicated in the analysis of variance.

Figure 21 indicated the interaction occurred between the small schools. There was variation in the effect of size on innovation for the smaller schools.

The null hypothesis was rejected for I.Q. and the interaction of innovation and size on self-expression.

Table 48. Analysis of variance of aspiration level by type of school, size of school, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	164.813	164.813	10.107**
Size	2	372.563	186.281	11.423**
I.Q.	1	17.563	17.563	1.077
Innovation x size	2	86.188	43.094	2.643
Innovation x I.Q.	1	6.813	6.813	0.418
Size x I.Q.	2	153.063	76.531	4.693**
Innovation x size x I.Q.	2	11.563	5.781	0.355
Error	796	12980.438	16.307.	

** Significant at or beyond the one per cent level

Table 49. Analysis of variance of intellectual climate by type of school, size of school, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	119.563	119.563	3.174
Size	2	1518.875	759.438	20.162**
I.Q.	1	51.313	51.313	1.362
Innovation x size	2	79.688	39.844	1.058
Innovation x I.Q.	1	4.063	4.063	0.108
Size x I.Q.	2	424.063	212.031	5.629**
Innovation x size x I.Q.	2	82.625	41.313	1.097
Error	796	29982.563	37.667	

** Significant at or beyond the one per cent level

Table 50. Analysis of variance of student dignity by type of school, size of school, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	0.125	0.125	0.005
Size	2	153.813	76.906	3.013*
I.Q.	1	79.125	79.125	3.100
Innovation x size	2	505.250	252.675	9.898**
Innovation x I.Q.	1	7.063	7.063	0.277
Size x I.Q.	2	53.438	26.719	1.047
Innovation x size x I.Q.	2	4.938	2.469	0.097
Error	796	20315.313	25.522	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 51. Analysis of variance of academic climate by type of school, size of school, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	29.039	29.039	3.083
Size	2	811.527	405.764	43.077**
I.Q.	1	28.051	28.051	2.978
Innovation x size	2	262.391	131.195	13.928**
Innovation x I.Q.	1	0.117	0.117	0.012
Size x I.Q.	2	99.582	49.791	5.286**
Innovation x size x I.Q.	2	29.422	14.711	1.562
Error	796	7497.992	9.420	

** Significant at or beyond the one per cent level

Table 52. Analysis of variance of academic achievement by type of school, size of school, and I.Q.

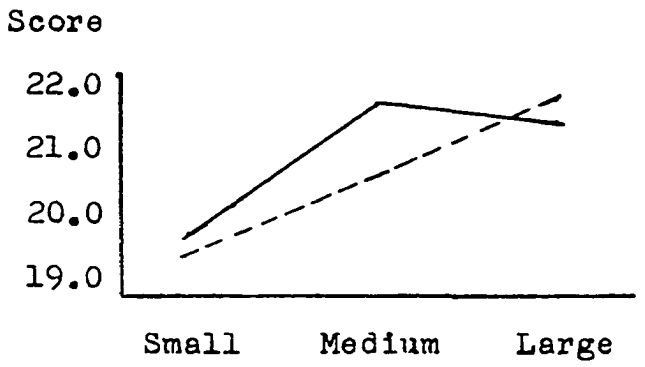
Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	4.563	4.563	0.105
Size	2	607.188	303.594	7.014**
I.Q.	1	66.375	66.375	1.634
Innovation x size	2	139.313	69.656	1.609
Innovation x I.Q.	1	0.000	0.000	0.000
Size x I.Q.	2	359.750	179.875	4.156*
Innovation x size x I.Q.	2	14.625	7.313	0.169
Error	796	34452.000	43.281	

** Significant at or beyond the one per cent level

Table 53. Analysis of variance of self-expression by type of school, size of school, and I.Q.

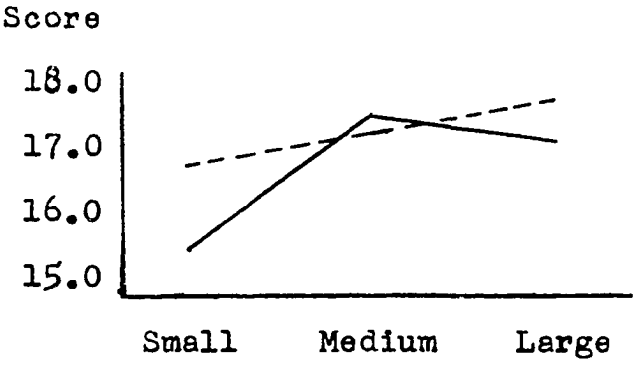
Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	21.063	21.063	0.734
Size	2	175.688	87.844	3.061*
I.Q.	1	113.875	113.875	3.968*
Innovation x size	2	215.375	107.688	3.752*
Innovation x I.Q.	1	4.563	4.563	0.159
Size x I.Q.	2	102.188	51.094	1.780
Innovation x size x I.Q.	2	29.750	14.875	0.518
Error	796	22846.500	28.702	

* Significant at or beyond the five per cent level



High I.Q. Group —— Low I.Q. Group - - - - -

Figure 15. Interaction of size and I.Q. on aspiration level



High I.Q. Group —— Low I.Q. Group - - - - -

Figure 16. Interaction of size and I.Q. on intellectual climate

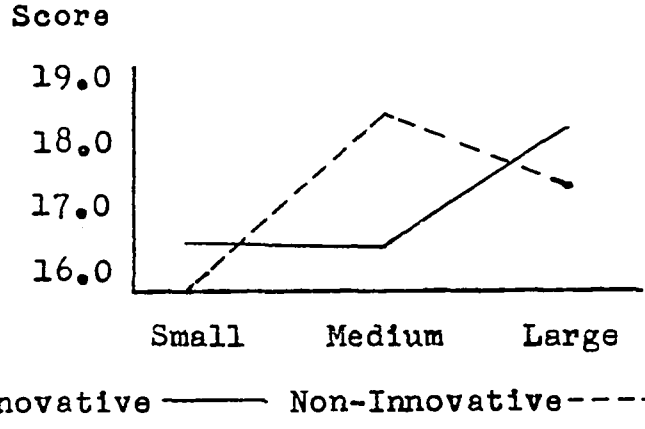


Figure 17. Interaction of innovation and size on student dignity

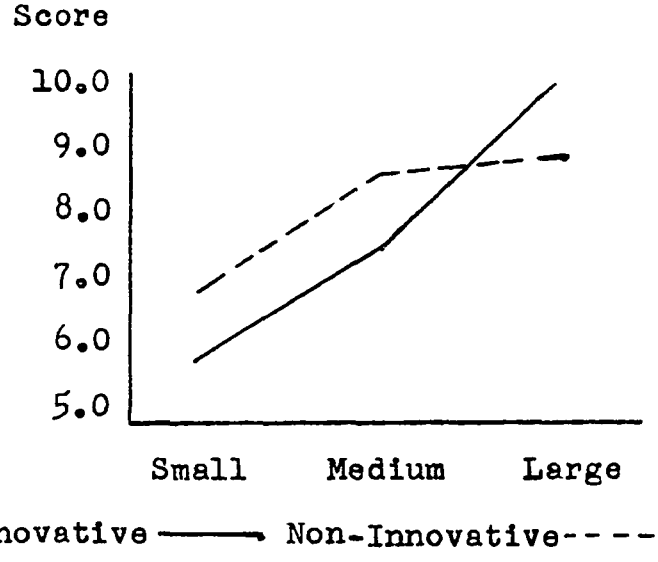


Figure 18. Interaction of innovation and size on academic climate

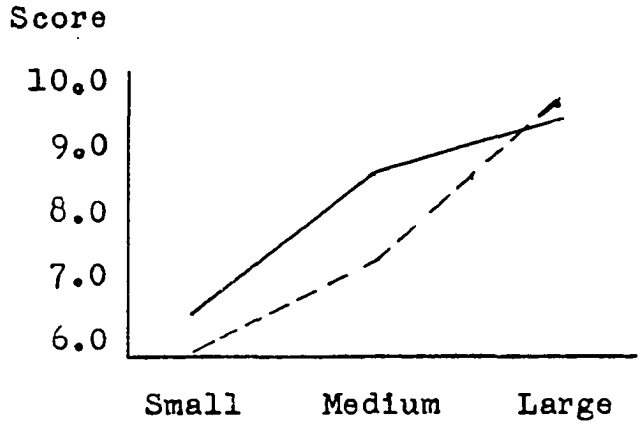


Figure 19. Interaction of size and I.Q. on academic climate

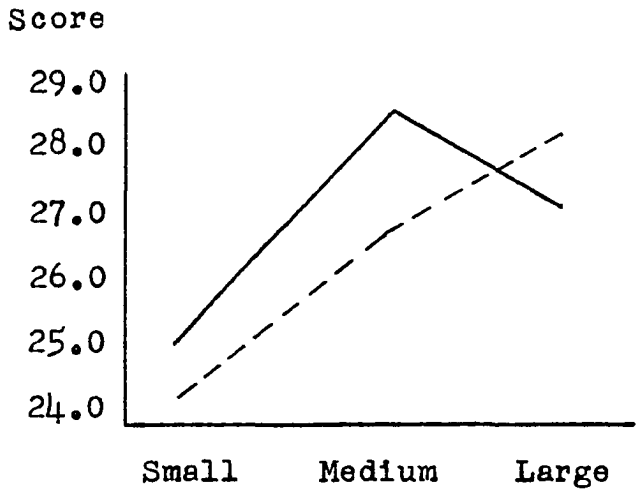


Figure 20. Interaction of size and I.Q. on academic achievement

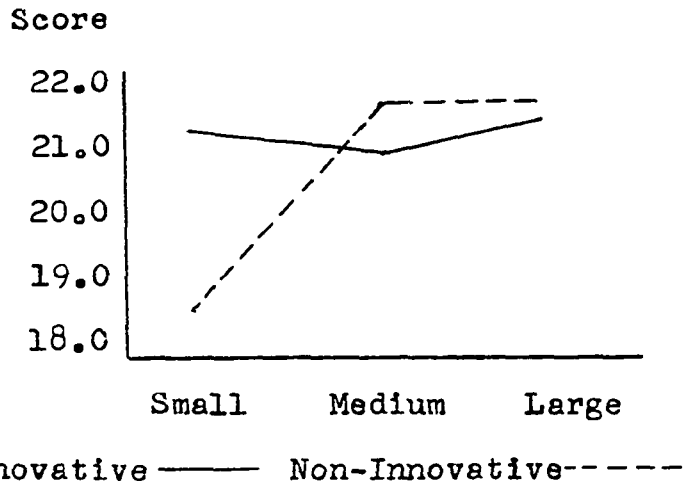


Figure 21. Interaction of innovation and size on self-expression

Null Hypothesis 10

There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of school size, sex, and intellectual aptitude.

Tables 54, 55, 56, 57, 58, and 59 presented the results of the analysis of variance.

Significant differences were indicated for the main effects innovation, size, and sex; and the interactions of size and sex, and innovation, size, and sex in Table 54. The other main effect and the remaining interactions were not significant.

The difference in the main effect innovation favored the innovative schools.

A comparison of the means by levels of school size indicated significant difference between small and large sized schools, and between small and medium sized schools. In each case, the difference favored the larger school in the comparison. The Scheffe results reported an F of 6.040** for the small and medium sized schools which was significant at the one per cent level. The comparison for the medium and large sized schools yielded an F of 1.675 which was not significant. The difference in sex favored the females.

Figure 22 indicated the interaction between size and sex occurred between the sexes in the large sized schools.

Figure 23 was a graphic representation of the three-way interaction of innovation, size, and sex. The interaction was due to an inversion of scores by sexes in the medium sized, innovative school and the large sized, non-innovative school.

The significant main effects must be considered relative to the significant interactions.

The null hypothesis was rejected for innovation, size, and sex; and the interactions of size and sex; and innovation, size, and sex on aspiration level.

In Table 55 significant differences were indicated for the main effects size and sex, the interaction of innovation and I.Q., and the interaction of size and sex. The other main effects and the remaining interactions were not significant.

A Scheffe test revealed the following F values for levels of size: small and medium sized schools, 2.67; and medium and large sized schools, 11.613**. The latter value was significant at the one per cent level. Therefore, there were significant differences between small and large sized schools, and between medium and large sized schools. In each comparison the large sized schools were favored.

The significant difference in scores for the main effect

sex favored the females.

Figure 24 indicated the interaction of innovation and I.Q. was due to an inversion of scores of I.Q. groups between types of schools.

In Figure 25 an inversion of scores of I.Q. groups in large schools was evident.

The significant main effects must be considered in the light of these interactions.

The null hypothesis was rejected for size, sex, the interaction of size and sex, and the interaction of innovation and I.Q. on intellectual climate.

Table 56 presented significant F values for the main effect innovation, and for the interaction of innovation and size. Both values were significant at the five per cent level. The other main effects and the remaining interactions were not significant.

The difference in type of schools favored the non-innovative schools.

Figure 26 indicated the interaction occurred between the medium sized schools on innovation. The significant main effect must be considered relative to the interaction.

The null hypothesis was rejected for innovation, and the interaction of innovation and size on student dignity.

Table 57 presented findings on academic climate. Significant differences were indicated for innovation; size; and

the interactions of innovation and size, and innovation and I.Q. The other main effects and the remaining interactions were not significant.

The difference in innovation favored the non-innovative schools.

The comparison of the levels of size of school to determine where the differences existed revealed F values of 8.77** for small and medium sized schools, and 21.26** for medium and large sized schools. Both comparisons were significant at the one per cent level, and favored the larger sized school in each comparison. Differences existed between all three levels of size.

Figure 27 indicated the interaction occurred because of the inversion of scores of innovation in the large sized schools.

In Figure 28 it was indicated that minor variation occurred in the scores of the low I.Q. group on innovation, causing the significant interaction. The significant main effects must be considered in light of these interactions.

The null hypothesis was rejected for the main effects of innovation and size, for the interaction of innovation and size, and for the interaction of innovation and I.Q. on academic climate.

In Table 58 significant F values were found for the main effect size, and for the two-way interaction of size and

sex. The first value was significant at the one per cent level; the latter was significant at the five per cent level. The other main effects and the remaining interactions were not significant.

Comparisons of the levels of size yielded F values of 6.50** for small and medium sized schools, and .008 for medium and large sized schools. The first comparison was significant at the one per cent level. This indicated there were differences between small and large sized schools, and between small and medium sized schools. In each case the difference favored the larger school in the comparison.

Figure 29 presented the graphic representation of the interaction between size and sex. The interaction occurred between sexes in the large sized schools. The significant interaction must be taken into account when considering the significant main effect.

The null hypothesis was rejected for the main effect size, and the interaction of size and sex on academic achievement.

The main effect size was significant in Table 59 at the one per cent level. Significant interactions were found for the two-way interactions of innovation and size, and size and sex; and for the three-way interaction of innovation, size and sex. The other main effects and interactions were not significant.

A comparison of the levels of size indicated F values that were not significant. The Scheffe test yielded 2.86 for small and medium sized schools, and .09 for medium and large sized schools. Therefore, the significant difference that occurred was between small and large sized schools.

Both two-way interactions were significant at the one per cent level, while the three-way interaction was significant at the five per cent level. Figure 30 indicated the interaction between innovation and size occurred in the small sized schools.

Figure 31 presented the interaction of size and sex. This interaction was due to an inversion of scores between sexes in the small sized schools.

In Figure 32 an inversion of scores by sex between types of schools occurred in the large sized schools. When considering the significant main effects, it was necessary also to consider the significant interactions as well.

The null hypothesis was rejected for the main effect size; for the interaction of innovation and size; for the interaction of size and sex; and for the interaction of innovation, size, and sex on self-expression.

Table 54. Analysis of variance of aspiration level by type of school, size of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	70.883	70.883	4.516*
Size	2	323.271	161.636	10.297**
Sex	1	87.532	87.532	5.576*
I.Q.	1	10.748	10.748	0.685
Innovation x size	2	41.276	20.638	1.315
Innovation x sex	1	31.546	31.546	2.010
Innovation x I.Q.	1	14.087	14.087	0.897
Size x sex	2	175.142	87.571	5.579**
Size x I.Q.	2	33.316	16.658	1.061
Sex x I.Q.	1	19.079	19.079	1.215
Innovation x size x sex	2	98.949	49.474	3.152*
Innovation x size x I.Q.	2	9.455	4.727	0.301
Innovation x sex x I.Q.	1	0.295	0.295	0.019
Size x sex x I.Q.	2	11.769	5.884	0.375
Innovation x size x sex x I.Q.	2	27.937	13.968	0.890
Error	784	12306.580	15.697	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 55. Analysis of variance of intellectual climate by type of school, size of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	81.243	81.243	2.204
Size	2	1013.315	506.658	13.745**
Sex	1	190.970	190.970	5.181*
I.Q.	1	37.082	37.082	1.006
Innovation x size	2	58.601	29.300	0.795
Innovation x sex	1	11.071	11.071	0.300
Innovation x I.Q.	1	162.605	162.605	4.411*
Size x sex	2	299.100	149.550	4.057*
Size x I.Q.	2	99.144	49.572	1.345
Sex x I.Q.	1	103.182	103.182	2.799
Innovation x size x sex	2	71.527	35.764	0.970
Innovation x size x I.Q.	2	108.137	54.069	1.467
Innovation x sex x I.Q.	1	133.902	133.902	0.363
Size x sex x I.Q.	2	28.957	14.478	0.393
Innovation x size x sex x I.Q.	2	41.726	20.863	0.566
Error	784	28900.169	36.862	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 56. Analysis of variance of student dignity by type of school, size of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	121.958	121.958	4.830*
Size	2	12.471	6.236	0.247
Sex	1	26.564	26.564	1.052
I.Q.	1	39.926	39.926	1.581
Innovation x size	2	166.862	83.431	3.304*
Innovation x sex	1	58.805	58.805	2.329
Innovation x I.Q.	1	1.614	1.614	0.064
Size x sex	2	146.702	73.351	2.905
Size x I.Q.	2	41.330	20.665	0.818
Sex x I.Q.	1	1.374	1.374	0.054
Innovation x size x sex	2	71.739	35.869	1.421
Innovation x size x I.Q.	2	29.925	14.962	0.593
Innovation x sex x I.Q.	1	28.686	28.686	1.136
Size x sex x I.Q.	2	27.767	13.884	0.550
Innovation x size x sex x I.Q.	2	58.402	29.201	1.156
Error	784	19796.574	25.251	

* Significant at or beyond the five per cent level

Table 57. Analysis of variance of academic climate by type of school, size of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	60.780	60.780	6.556*
Size	2	126.776	63.388	6.837**
Sex	1	4.048	4.048	0.437
I.Q.	1	3.670	3.670	0.396
Innovation x size	2	100.040	50.020	5.395**
Innovation x sex	1	0.285	0.285	0.031
Innovation x I.Q.	1	39.236	39.236	4.232*
Size x sex	2	29.123	14.561	1.571
Size x I.Q.	2	4.427	2.214	0.239
Sex x I.Q.	1	11.999	11.999	1.294
Innovation x size x sex	2	14.383	7.192	0.776
Innovation x size x I.Q.	2	33.891	16.946	1.828
Innovation x sex x I.Q.	1	32.014	32.014	3.453
Size x sex x I.Q.	2	7.108	3.554	0.383
Innovation x size x sex x I.Q.	2	9.936	4.968	0.536
Error	734	7268.417	9.271	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 58. Analysis of variance of academic achievement by type of school, size of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	14.546	14.546	0.339
Size	2	628.715	314.357	7.319**
Sex	1	30.956	30.956	0.721
I.Q.	1	4.937	4.937	0.115
Innovation x size	2	82.577	41.288	0.961
Innovation x sex	1	10.005	10.005	0.233
Innovation x I.Q.	1	51.198	51.198	1.192
Size x sex	2	341.657	170.828	3.977*
Size x I.Q.	2	80.446	40.223	0.937
Sex x I.Q.	1	49.735	49.735	1.158
Innovation x size x sex	2	118.875	59.438	1.384
Innovation x size x I.Q.	2	9.614	4.807	0.112
Innovation x sex x I.Q.	1	58.920	58.920	1.372
Size x sex x I.Q.	2	9.234	4.617	0.108
Innovation x size x sex x I.Q.	2	21.836	10.918	0.254
Error	784	33674.695	42.952	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 59. Analysis of variance of self-expression by type of school, size of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	33.717	33.717	1.191
Size	2	738.631	369.315	13.049**
Sex	1	73.074	73.074	2.582
I.Q.	1	4.449	4.449	0.157
Innovation x size	2	366.833	183.417	6.481**
Innovation x sex	1	0.008	0.008	0.003
Innovation x I.Q.	1	1.875	1.875	0.066
Size x sex	2	351.101	175.551	6.203**
Size x I.Q.	2	128.110	64.055	2.263
Sex x I.Q.	1	34.922	34.922	1.234
Innovation x size x sex	2	197.807	98.904	3.495*
Innovation x size x I.Q.	2	62.360	31.180	1.102
Innovation x sex x I.Q.	1	33.628	33.628	1.188
Size x sex x I.Q.	2	35.707	17.853	0.631
Innovation x size x sex x I.Q.	2	32.301	16.150	0.571
Error	784	22188.640	28.302	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

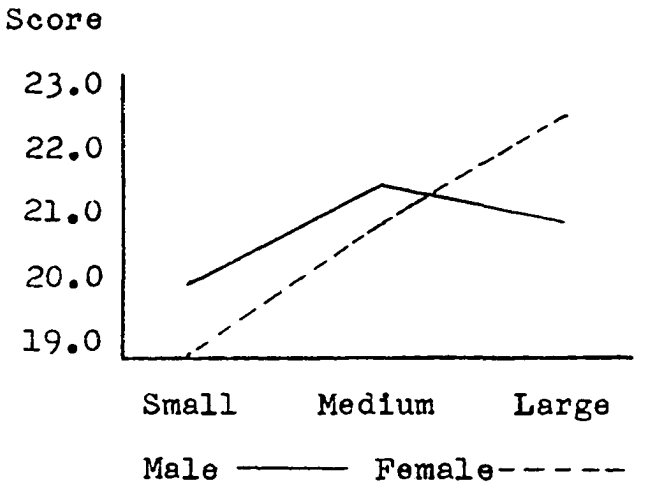


Figure 22. Interaction of size and sex on aspiration level

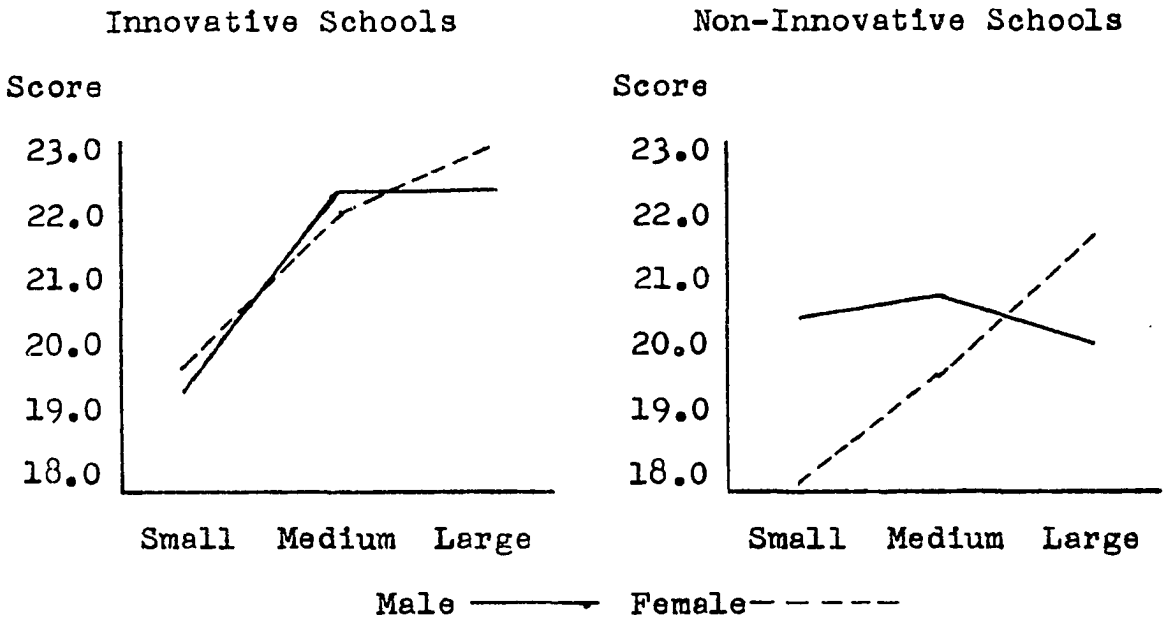
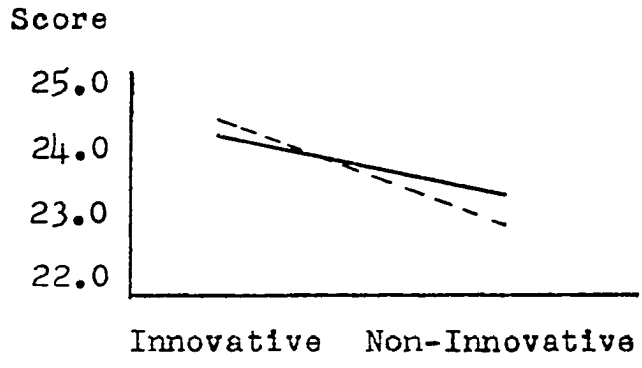
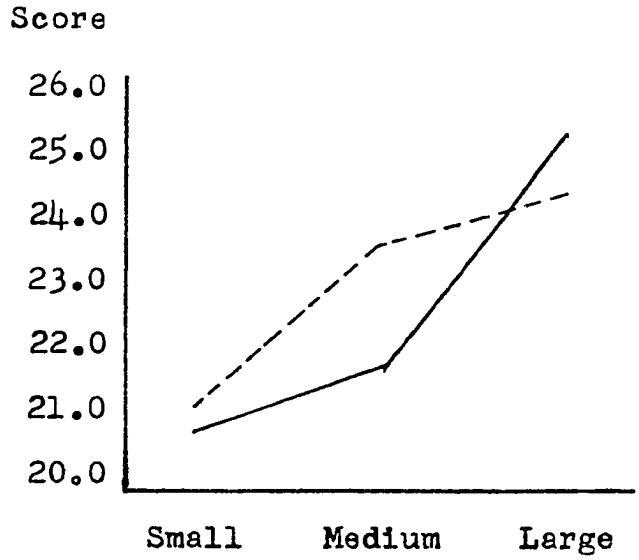


Figure 23. Interaction of innovation, size, and sex on aspiration level



High I.Q. Group —— Low I.Q. Group----

Figure 24. Interaction of innovation and I.Q. on intellectual climate



High I.Q. Group —— Low I.Q. Group------

Figure 25. Interaction of size and I.Q. on intellectual climate

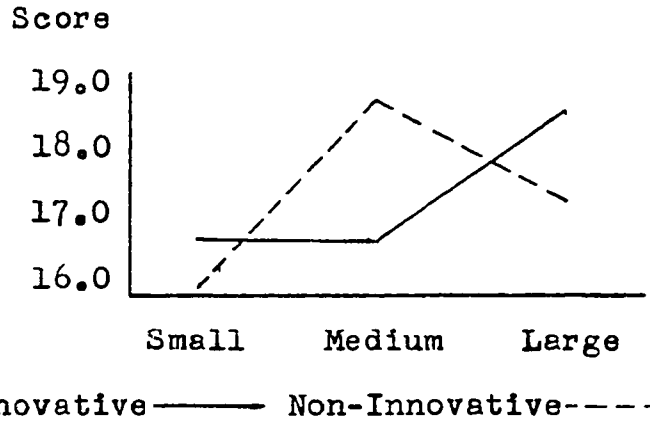


Figure 26. Interaction of innovation and size on student dignity

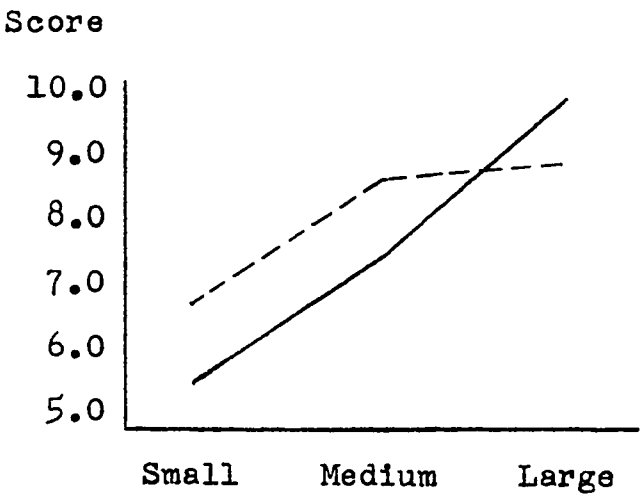


Figure 27. Interaction of innovation and size on academic climate

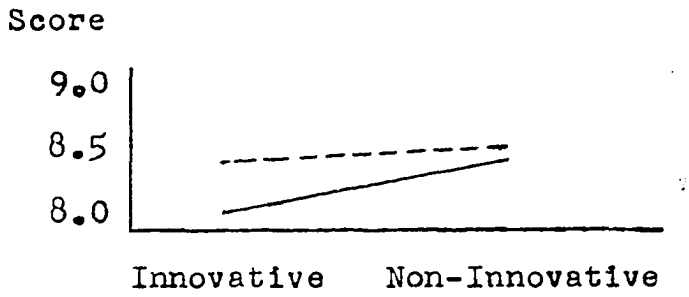


Figure 28. Interaction of innovation and I.Q. on academic climate

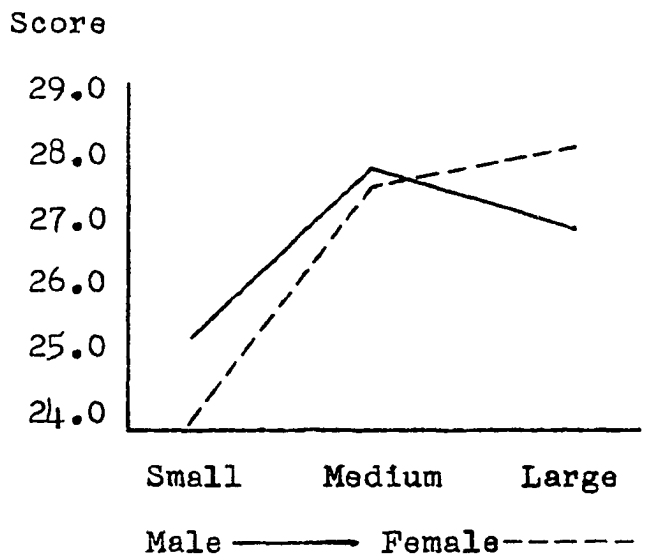


Figure 29. Interaction of size and sex on academic achievement

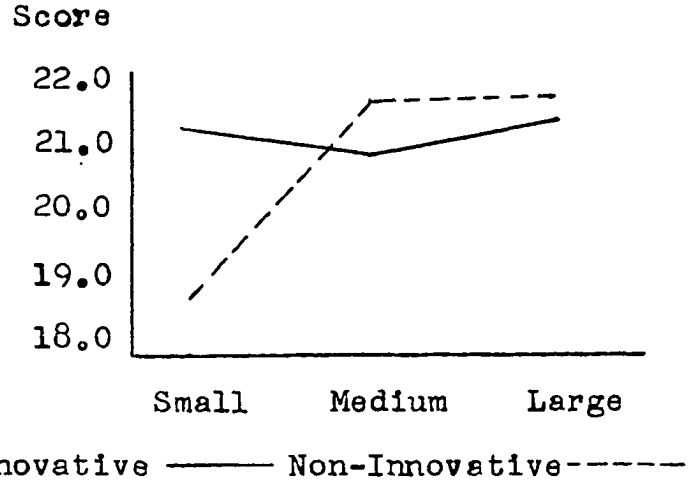


Figure 30. Interaction of innovation and size on self-expression

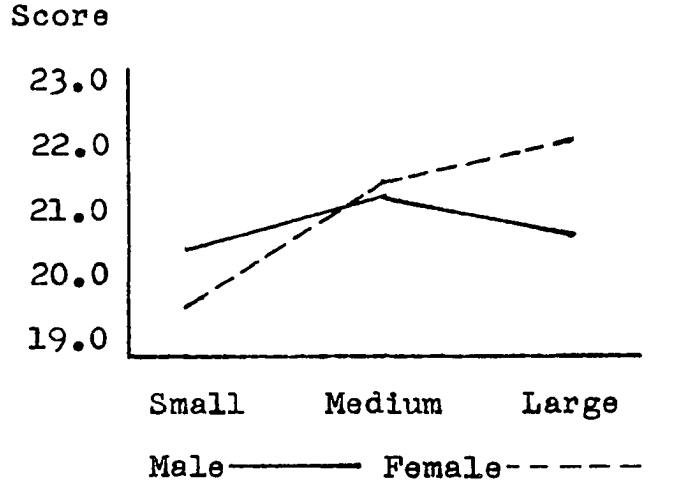


Figure 31. Interaction of size and sex on self-expression

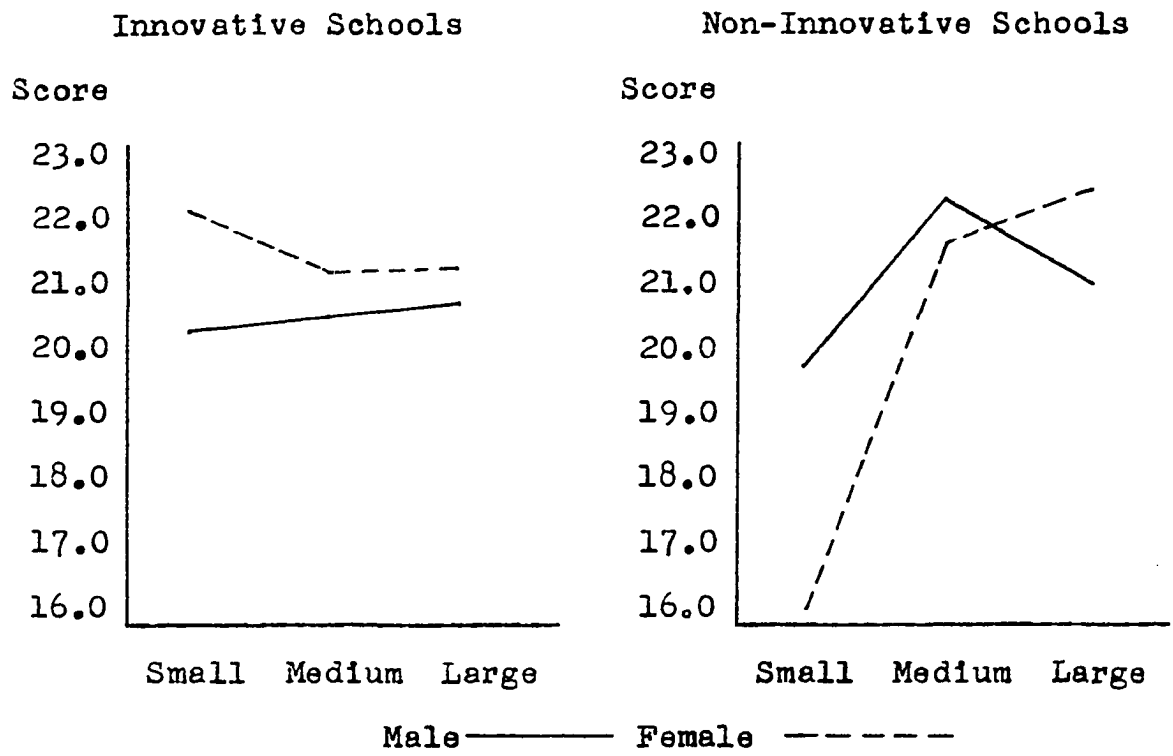


Figure 32. Interaction of innovation, size and sex on self-expression

Null Hypothesis 11

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools as measured by cumulative grade point average, rank in class, and/or ITED results.

The results of the analysis of variance were presented in Tables 60 and 61.

In Table 60 the F value was not significant. The null hypothesis was not rejected for type of school on grade point average.

In Table 61 an F of 18.514 was found. This was significant at the one per cent level. This difference favored the non-innovative schools. The null hypothesis was rejected for type of school on ITED results.

Table 60. Analysis of variance of grade point average by type of school

Source of variation	df	Sums of squares	Mean squares	F
Between	1	32.000	32.000	0.006
Within	807	4486832.000	5566.789	

Table 61. Analysis of variance of ITED results by type of school

Source of variation	df	Sums of squares	Mean squares	F
Between	1	1001.250	1001.250	18.514**
Within	807	43588.063	54.080	

** Significant at or beyond the one per cent level

Null Hypothesis 12

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex.

The results of the analysis of variance are presented in Tables 62 and 63.

In Table 62 a significant F value was reported for the main effect sex, which favored the females. The other main effect and the interaction were not significant. The null hypothesis was rejected for the main effect sex on grade point average.

Table 63 presented a significant F value for the main effect innovation at the one per cent level. This difference favored the non-innovative schools. The main effect sex, and the interaction of sex and innovation were not significant. The null hypothesis was rejected for the main effect innovation on ITED results.

Table 62. Analysis of variance of grade point average by type of school and sex

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	16.000	16.000	0.003
Sex	1	129376.000	129376.000	23.793**
Innovation x sex	1	1712.000	1712.000	0.315
Error	801	4355520.000	5437.600	

** Significant at or beyond the one per cent level

Table 63. Analysis of variance of ITED results by type of school and sex

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	984.000	984.000	18.140**
Sex	1	0.625	0.625	0.012
Innovation x sex	1	61.875	61.875	1.141
Error	801	43449.688	54.244	

** Significant at or beyond the one per cent level

Null Hypothesis 13

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of school size.

Tables 64 and 65 presented the results of the analysis of variance.

There were no significant differences indicated in Table 64. The null hypothesis was not rejected on GPA.

Table 65 presented a significant F value, at the one per cent level for the main effect innovation. This difference favored the non-innovative schools. There were no other significant differences indicated. The null hypothesis was rejected for the main effect innovation on ITED results.

Table 64. Analysis of variance of grade point average by type of school and size of school

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	1472.793	1472.793	0.266
Size	2	15953.313	7976.656	1.439
Innovation x size	2	3418.791	1709.395	0.308
Error	802	4446872.833	5544.729	

Table 65. Analysis of variance of ITED results by type of school and size of school

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	1001.534	1001.534	18.545**
Size	2	216.247	108.123	2.002
Innovation x size	2	147.127	73.564	1.362
Error	802	43312.476	54.006	

** Significant at or beyond the one per cent level

Null Hypothesis 14

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of intellectual aptitude.

Tables 66 and 67 presented the results of the analysis of variance.

In Table 66 a significant F value was found for the main effect I.Q. at the one per cent level. No other significant values were found. The students in the higher I.Q. group had a significantly higher GPA. The null hypothesis was rejected for the main effect I.Q. on GPA.

Table 67 presented significant F values for both main effects. The interaction was not significant. Students in non-innovative schools scored higher on the ITED, as did the students in the higher I.Q. group. The null hypothesis was rejected for the main effects innovation and I.Q. on ITED results.

Table 66. Analysis of variance of grade point average by type of school and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	2625.521	2625.521	0.614
I.Q.	1	532161.301	532161.301	124.532**
Innovation x I.Q.	1	3.787	3.787	0.001
Error	804	3435739.647	4273.308	

** Significant at or beyond the one per cent level

Table 67. Analysis of variance of ITED results by type of school and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	302.264	302.264	8.082**
I.Q.	1	7177.334	7177.334	191.915**
Innovation x I.Q.	1	10.162	10.162	0.272
Error	804	30068.330	37.398	

** Significant at or beyond the one per cent level

Null Hypothesis 15

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex and intellectual aptitude.

Tables 68 and 69 presented the results of the analysis of variance.

In Table 68 all three main effects and the three-way interaction of innovation, sex, and I.Q. were significant. The two-way interactions were not significant. The difference in grade point average favored the innovative schools, the females, and the higher I.Q. group.

In order to determine the reason for the interaction, Figure 33 was developed. There was minor variability in the non-innovative schools which accounted for the significant interaction. The significance of the main effects must be considered in the light of this interaction.

The null hypothesis was rejected for the three main effects and the three-way interaction on GPA.

Table 69 presented findings that indicated significant F values for the main effects of innovation and I.Q. The differences favored the non-innovative schools and the students in the higher I.Q. group. The other main effect and the interactions were not significant.

The null hypothesis was rejected for the main effects of innovation and I.Q. on ITED results.

Table 68. Analysis of variance of grade point average by type of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	5952.000	5952.000	7.195**
Sex	1	90288.000	90288.000	10.914**
I.Q.	1	1009040.000	1009040.000	1219.737**
Innovation x sex	1	0.000	0.000	0.000
Innovation x I.Q.	1	32.000	32.000	0.039
Sex x I.Q.	1	1568.000	1568.000	1.895
Innovation x sex x I.Q.	1	3632.000	3632.000	4.390*
Error	800	661808.000	827.260	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 69. Analysis of variance of ITED results by type of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	515.813	515.813	13.583**
Sex	1	61.000	61.000	1.606
I.Q.	1	13522.375	13522.375	356.081**
Innovation x sex	1	29.125	29.125	0.767
Innovation x I.Q.	1	9.375	9.375	0.247
Sex x I.Q.	1	15.250	15.250	0.402
Innovation x sex x I.Q.	1	55.938	55.938	1.473
Error	800	30380.438	37.976	

** Significant at or beyond the one per cent level

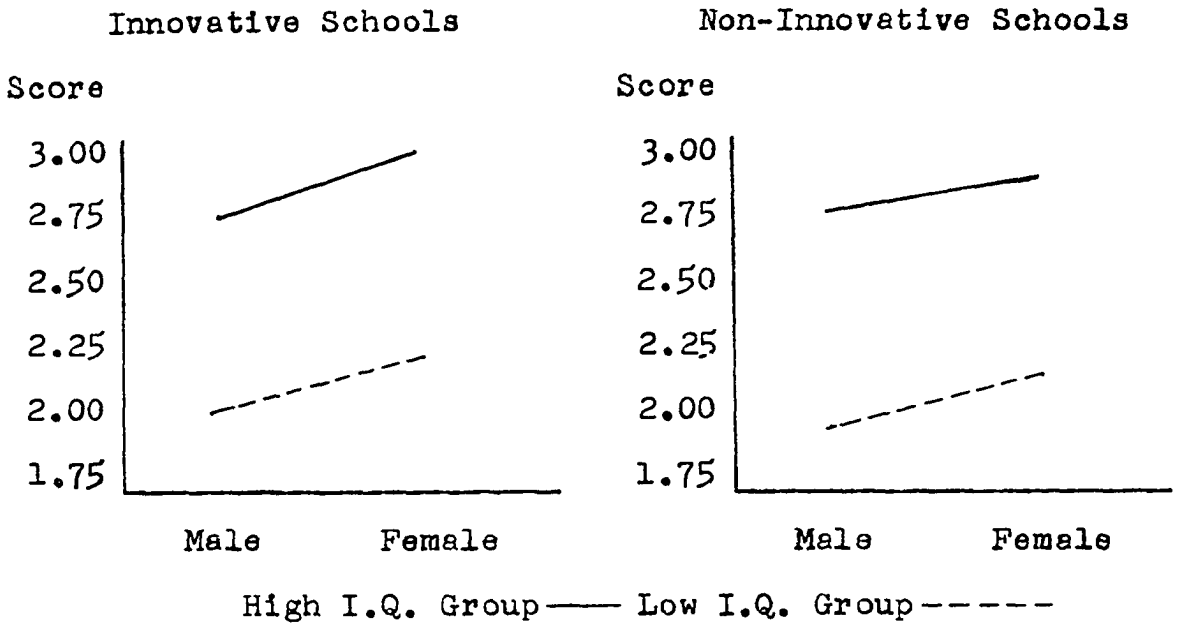


Figure 33. Interaction of innovation, size, and I.Q. on GPA

Null Hypothesis 16

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex and school size.

Tables 70 and 71 presented the results of the analysis of variance.

It was found in Table 70 that there were significant F values found for the main effects of size and sex, and for the interaction of size and sex. The other main effects and interactions were not significant.

A comparison of the levels of size was made to determine where the differences may have existed. The test between medium and large sized schools gave an F of 3.0555* which was significant at the five per cent level and favored the larger sized schools. The comparison between small and large sized schools yielded an F of .8832 which was not significant. Therefore, the difference appeared to exist between the small and the medium sized schools, favoring the small sized schools; and between the medium and large sized schools, favoring the large sized schools.

To determine where the interaction may have occurred, the means were graphed in Figure 34. Although the lines did not cross, there apparently was minor variation of size on sex, and vice versa, to cause the significant interaction.

The null hypothesis was rejected for the main effects of size and sex, and for the interaction of size and sex on GPA.

In Table 71 the only significant F value was for the main effect innovation at the one per cent level. All other treatments and treatment combinations were not significant. The difference in ITED results favored the non-innovative schools.

The null hypothesis was rejected for the main effect innovation on ITED results.

Table 70. Analysis of variance of grade point average by type of school, size of school, and sex

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	912.000	912.000	0.169
Size	2	42784.000	21392.000	3.960*
Sex	1	90896.000	90896.000	16.826**
Innovation x size	2	5040.000	2520.000	0.467
Innovation x sex	1	2144.000	2144.000	0.397
Size x sex	2	42128.000	21064.000	3.900*
Innovation x size x sex	2	3280.000	1640.000	0.304
Error	796	4299872.000	5401.849	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 71. Analysis of variance of ITED results by type of school, size of school, and sex

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	544.688	544.688	9.979**
Size	2	134.188	67.094	1.229
Sex	1	27.125	27.125	0.497
Innovation x size	2	144.063	72.031	1.319
Innovation x sex	1	2.813	2.813	0.052
Size x sex	2	162.875	81.438	1.492
Innovation x size x sex	2	123.375	61.688	1.130
Error	796	43450.188	54.586	

** Significant at or beyond the one per cent level

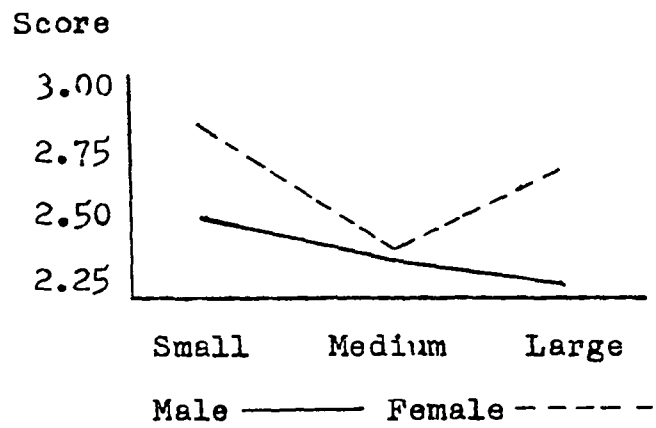


Figure 34. Interaction of size and sex on GPA

Null Hypothesis 17

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of school size and intellectual aptitude.

Tables 72 and 73 presented the results of the analysis of variance.

The only significances indicated in Table 72 were for the main effects I.Q. and size. The other main effect and the interactions were not significant. The difference in I.Q. favored the higher I.Q. group. The mean for this group was much larger than that of the lower I.Q. group.

A comparison of the means of the levels of size revealed that the difference existed between the small sized schools and the medium sized schools. The F values on the comparisons were as follows: medium and large sized schools, 2.076; and large and small sized schools, 1.062. These two values were not significant and, therefore, the difference existed between the levels of schools compared in the analysis of variance.

The null hypothesis was rejected for the main effects size and I.Q. on GPA.

In Table 73 the main effects of innovation and I.Q. were significant at the one per cent level. The other main effects

and the interactions were not significant. Analyzing the means revealed the difference between types of schools favored the non-innovative schools on ITED results. The high I.Q. group had a significantly higher mean score on the ITED than did the low I.Q. group. The difference in mean scores was 8.43443.

The null hypothesis was rejected for innovation and I.Q. on ITED results.

Table 72. Analysis of variance of grade point average by type of school, size of school, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	704.000	704.000	0.157
Size	2	27520.000	13760.000	3.071*
I.Q.	1	845152.000	845152.000	188.630**
Innovation x size	2	26016.000	13008.000	2.903
Innovation x I.Q.	1	672.000	672.000	0.150
Size x I.Q.	2	8496.000	4248.000	0.948
Innovation x size x I.Q.	2	12256.000	6128.000	1.368
Error	796	3566288.000	4480.261	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

Table 73. Analysis of variance of ITED results by type of school, size of school, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	315.688	315.688	7.510**
Size	2	78.306	39.153	0.931
I.Q.	1	9905.938	9905.938	235.670**
Innovation x size	2	15.375	7.688	0.183
Innovation x I.Q.	1	0.438	0.438	0.001
Size x I.Q.	2	43.938	21.969	0.523
Innovation x size x I.Q.	2	66.563	33.281	0.792
Error	796	33458.313	42.033	

** Significant at or beyond the one per cent level

Null Hypothesis 18

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex, school size, and intellectual aptitude.

Tables 74 and 75 presented the results of the analysis of variance.

In Table 74 it showed significant differences for three main effects size, sex, and I.Q. at the one per cent level; and the interaction of size and sex at the one per cent level. The main effect innovation and the other interactions were not significant on GPA.

A comparison of the levels of school size revealed F values of 1.181 for the small and large sized schools, and 2.311 for the medium and large sized schools. Neither of these values was significant. Therefore, the difference between levels of size existed between the small and medium sized schools.

The differences in sex favored the females, while the difference in I.Q. favored the high I.Q. group.

Figure 35 indicated the interaction between size and sex on GPA occurred between the males and females in the medium sized schools. The GPA of females in the medium sized schools dropped considerably in relation to the females in the small

and large sized schools. The significant main effects must be considered in the light of this interaction.

The null hypothesis was rejected for the main effects of size, sex, and I.Q.; and for the interaction of size and sex on GPA.

Table 75 presented findings indicating a significant F value for innovation at the five per cent level, for I.Q. at the one per cent level, and for the interaction of size and I.Q. at the five per cent level. The other main effects and interactions were not significant. The difference in innovation favored the non-innovative schools, while the difference in I.Q. favored the high I.Q. group.

Figure 36 indicated the interaction between size and I.Q. occurred between the medium sized schools. Minor variation existed.

The null hypothesis was rejected for innovation I.Q., and the interaction of size and I.Q. on ITED results.

Table 74. Analysis of variance of grade point average by type of school, size of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	258.191	258.191	0.064
Size	2	30270.501	15135.251	3.754**
Sex	1	60599.862	60599.862	15.030**
I.Q.	1	142089.290	142089.290	35.241**
Innovation x size	2	7382.451	3691.225	0.916
Innovation x sex	1	1322.738	1322.738	0.328
Innovation x I.Q.	1	3594.814	3594.814	0.892
Size x sex	2	67426.334	33713.167	8.362**
Size x I.Q.	2	13360.234	6680.117	1.657
Sex x I.Q.	1	14.558	14.558	0.004
Innovation x size x sex	2	23597.447	11798.724	2.926
Innovation x size x I.Q.	2	19009.822	9504.911	2.357
Innovation x sex x I.Q.	1	530.293	530.293	0.132
Size x sex x I.Q.	2	16023.699	8011.849	1.987
Innovation x size x sex x I.Q.	2	6859.750	3429.875	0.851
Error	784	3161021.305	4031.915	

** Significant at or beyond the one per cent level

Table 75. Analysis of variance of ITED results by type of school, size of school, sex, and I.Q.

Source of variation	df	Sums of squares	Mean squares	F
Innovation	1	152.950	152.950	4.179*
Size	2	10.339	5.170	0.141
Sex	1	5.704	5.704	0.156
I.Q.	1	2813.844	2813.844	76.875**
Innovation x size	2	33.646	16.823	0.460
Innovation x sex	1	0.386	0.386	0.011
Innovation x I.Q.	1	96.546	96.546	2.638
Size x sex	2	181.314	90.657	2.477
Size x I.Q.	2	260.769	130.384	3.562*
Sex x I.Q.	1	110.745	110.745	3.026
Innovation x size x sex	2	41.642	20.821	0.569
Innovation x size x I.Q.	2	110.749	55.374	1.513
Innovation x sex x I.Q.	1	77.330	77.330	2.113
Size x sex x I.Q.	2	216.174	108.087	2.953
Innovation x size x sex x I.Q.	2	59.638	29.819	0.815
Error	784	28696.761	36.603	

** Significant at or beyond the one per cent level

* Significant at or beyond the five per cent level

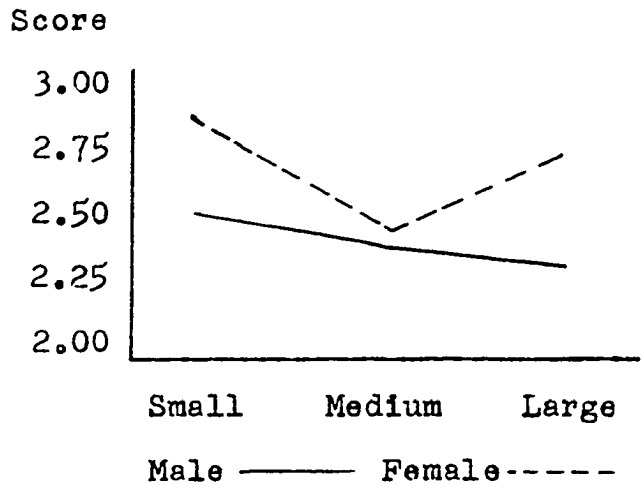


Figure 35. Interaction of size and sex on GPA

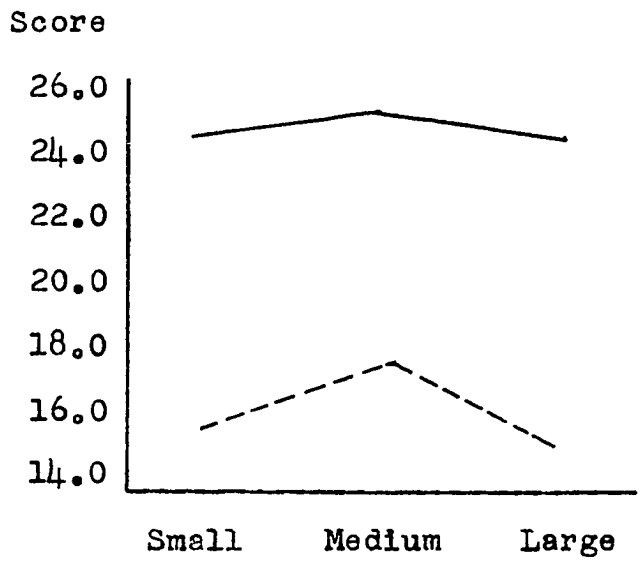


Figure 36. Interaction of size and I.Q. on ITED results

SUMMARY AND CONCLUSIONS

This chapter contains sections devoted to a summary of the study, conclusions, discussion, limitations of the study, and recommendations for further research.

Summary

The purpose of this study was to determine if an organization and methodology including team teaching, large group and small group instruction, modular scheduling, and independent study in selected Iowa high schools was effective in improving the attitudes toward their school and raising the level of achievement of students in comparison to programs of instruction not utilizing all of these practices.

Three schools were selected that used these five practices and were defined as innovative schools for this study. Three schools not using these practices were matched with them on the basis of size, and were defined as non-innovative schools.

The High School Characteristics Index was administered to the students in the senior class of each of the six schools. This data supplied scores for six variables on attitude: aspiration level, intellectual climate, student dignity, academic climate, academic achievement, and self-expression.

At the completion of the 1969-70 school year, data on grade point average, class rank, ITED composite scores, and

I.Q. scores were collected. The grade point average, class rank, and ITED composite scores furnished the data for the achievement variables. The variable for class rank was later dropped as a measure of achievement.

The I.Q. scores were divided into two groups, high and low. This, along with school size, sex of student, and type of school, comprised the independent variables used in the study.

Eighteen null hypotheses were tested in this study. The hypotheses and their results are listed below. The results are listed by variable as follows:

variable 1	aspiration level
variable 2	intellectual climate
variable 3	student dignity
variable 4	academic climate
variable 5	academic achievement
variable 6	self-expression
variable 7	grade point average
variable 9	ITED results

Null Hypothesis 1

There is no significant difference in attitude as measured by an attitude scale between students in innovative schools and students in non-innovative schools.

Results: 1. Rejected on innovation.
2. Rejected on innovation.
3. Not rejected.
4. Not rejected.
5. Not rejected.
6. Not rejected.

Null Hypothesis 2

There is no significant correlation between the atti-

tudes of students and the attitudes of faculty members in either innovative or non-innovative schools

Results: Not tested due to insufficient data.

Null Hypothesis 3

There is no significant difference in attitude between instructors in innovative and non-innovative schools.

Results: Not tested due to insufficient data.

Null Hypothesis 4

There is no significant difference in attitude as measured by the High School Characteristics Index (HSCI) between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex.

Results:
1. Rejected on innovation.
2. Rejected on innovation.
3. Not rejected.
4. Not rejected.
5. Not rejected.
6. Rejected on sex.

Null Hypothesis 5

There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of intellectual aptitude.

Results:
1. Rejected on innovation.
2. Not rejected.
3. Not rejected.
4. Not rejected.
5. Not rejected.
6. Not rejected.

Null Hypothesis 6

There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of school size.

Results: 1. Rejected on innovation and size.
2. Rejected on innovation and size.
3. Rejected on innovation, size, and the interaction of innovation and size.
4. Rejected on innovation, size, and the interaction of innovation and size.
5. Not rejected.
6. Rejected on the interaction of innovation and size.

Null Hypothesis 7

There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex and school size.

Results: 1. Rejected on innovation; size; the interaction of size and sex; and the interaction of innovation, size, and sex.
2. Rejected on size and the interaction of size and sex.
3. Rejected on the interaction of innovation and size, and the interaction of size and sex.
4. Rejected on size, sex, and the interaction of innovation and size.
5. Rejected on size and the interaction of innovation and sex.
6. Rejected on size; the interaction of innovation and size; the interaction of innovation and sex; and the interaction of innovation, size, and sex.

Null Hypothesis 8

There is no significant difference in attitude as meas-

ured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex and intellectual aptitude.

Results: 1. Rejected on innovation.
2. Rejected on innovation.
3. Not rejected.
4. Not rejected.
5. Rejected on sex and the interaction of innovation, sex, and I.Q.
6. Rejected on sex.

Null Hypothesis 9

There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of size and intellectual aptitude.

Results: 1. Rejected on innovation, size, and the interaction of size and I.Q.
2. Rejected on size and the interaction of size and I.Q.
3. Rejected on size and the interaction of innovation and size.
4. Rejected on size, the interaction of innovation and size, and the interaction of size and I.Q.
5. Rejected on size and the interaction of size and I.Q.
6. Rejected on size, I.Q., and the interaction of innovation and size.

Null Hypothesis 10

There is no significant difference in attitude as measured by the HSCI between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of school size, sex, and intellectual aptitude.

Results: 1. Rejected on innovation; size; sex; the interaction of size and sex; and the interaction of innovation, size, and sex.
2. Rejected on size, sex, the interaction of innovation and I.Q., and the interaction of size and sex.
3. Rejected on innovation and the interaction of innovation and size.
4. Rejected on innovation, size, the interaction of innovation and size, and the interaction of innovation and I.Q.
5. Rejected on size and the interaction of size and sex.
6. Rejected on size; the interaction of innovation and size; the interaction of size and sex; and the interaction of innovation, size, and sex.

Null Hypothesis 11

There is no significant difference in achievement scores, rank in class, and GPA between students in innovative schools and students in non-innovative schools as measured by cumulative grade point average, rank in class, and/or ITED results.

Results: 7. Not rejected.
9. Rejected on innovation.

Null Hypothesis 12

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex.

Results: 7. Rejected on sex.
9. Rejected on innovation.

Null Hypothesis 13

There is no significant difference in achievement scores, rank in class or GPA between students in innovative schools

and students in non-innovative schools when students are also categorized on the basis of school size.

Results: 7. Not rejected.
9. Rejected on innovation.

Null Hypothesis 14

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of intellectual aptitude.

Results: 7. Rejected on I.Q.
9. Rejected on innovation and I.Q.

Null Hypothesis 15

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex and intellectual aptitude.

Results: 7. Rejected on innovation; sex; I.Q.; and the interaction of innovation, sex, and I.Q.
9. Rejected on innovation and I.Q.

Null Hypothesis 16

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex and school size.

Results: 7. Rejected on size, sex, and the interaction of size and sex.
9. Rejected on innovation.

Null Hypothesis 17

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of school size and intellectual aptitude.

Results: 7. Rejected on size and I.Q.
9. Rejected on innovation and I.Q.

Null Hypothesis 18

There is no significant difference in achievement scores, rank in class, or GPA between students in innovative schools and students in non-innovative schools when students are also categorized on the basis of sex, school size, and intellectual aptitude.

Results: 7. Rejected on size, sex, I.Q., and the interaction of size and sex.
9. Rejected on innovation, I.Q., and the interaction of size and I.Q.

Conclusions

Several questions were raised in the first chapter. These questions and their answers, as revealed by this study, will now be presented. When appropriate, other observations gained through the research will be added.

Question 1

Do students in schools using team teaching, large group and small group instruction, modular scheduling, and independent study have a more positive attitude toward school

than students in non-innovative schools?

The research revealed that there are differences in attitude between students in the innovative schools and students in the non-innovative schools used in this study. These differences favored the innovative schools on aspiration level and intellectual climate. The other four factors - student dignity, academic climate, academic achievement, and self-expression - favored the non-innovative schools.

The variable, aspiration level, was found to be significant for innovation on all eight attitude hypotheses. Intellectual climate was related significantly to innovative schools on four of the eight tests, but not on the four-way classification analysis. Evidently, the scores on intellectual climate varied on size and sex. Student dignity and academic climate were significant, and favored the non-innovative schools. Academic achievement and self-expression were not significantly related to the main effect innovation on any of the tests.

Therefore, it may be said there were differences in the mean scores on attitude between innovative and non-innovative schools in this study; but these differences did not, on most attitude factors, favor the innovative schools. In summary, two factors, aspiration level and intellectual climate, were significantly related to innovative schools; two factors, student dignity and academic climate, were significantly

related to non-innovative schools; and no significant association was found for academic achievement and self-expression.

Question 2

Is there a positive correlation between attitudes of students in either innovative or non-innovative schools and the attitude of their instructors?

No conclusion can be drawn on this question since it was impossible to test for it due to insufficient data on instructors.

Question 3

Do instructors in innovative schools have a more positive attitude toward school than instructors in non-innovative schools?

No conclusion can be drawn on this question since it was impossible to test for it due to insufficient data on instructors.

Question 4

Do students in innovative schools tend to achieve higher than students in non-innovative schools as measured by grade point average (GPA), rank in class, and/or Iowa Tests of Educational Development (ITED) results?

Although the grade point averages of students in innovative schools were higher than the grade point averages of students in non-innovative schools, the difference was not significant. This factor was influenced most by size of

school, sex of student, and I.Q. group. However, there was a significant difference in the ITED results between innovative and non-innovative schools. Students in the non-innovative schools scored significantly higher on the composite score. Therefore, it could be said students in non-innovative schools tended to score higher than students in innovative schools in this study.

Question 5

Is there a significant difference in attitude between sexes in either innovative or non-innovative schools?

There was some difference in attitude between the sexes. This difference favored the females on all factors of attitude except for academic climate. However, the differences were significant on aspiration level and intellectual climate only.

Question 6

Do attitudes held by students vary with size of school?

When size was used as the main effect, significant relationships were found for five of the six attitude factors. The mean scores for each factor were progressively larger as the size of the school increased. In other words, the students of the small sized schools scored lowest on all six attitude factors, and the students of the large sized schools scored highest on all six attitude factors. Significant differences were indicated for all six attitude factors on size;

however, when the four-way classification was used, significance was not indicated for student dignity. The other five factors indicated significant differences between large and small schools. On three of these there was significance between small and medium sized schools, and between medium and large sized schools.

It would seem, at least from this study, that the larger the school, the more favorable attitude the student had toward his environment.

Question 7

Are innovative schools more successful in raising the level of achievement of students than non-innovative schools?

Although the non-innovative schools tended to score significantly higher in achievement, when measured by the ITED, than the innovative schools, it was not possible to determine from this design whether or not one type of school would be more effective in raising achievement than another type of school. Achievement was measured at a point in time in this study and not over a period of time.

Question 8

Is there a significant correlation between attitude and achievement in school?

Significant correlations were found between attitude and achievement on five of the six attitude factors. Only aspiration level was not significantly correlated to one of

the three achievement variables. Grade point average varied significantly with student dignity and academic achievement; class rank varied significantly with intellectual climate, student dignity, and academic climate; and the ITED composite score varied significantly with student dignity, academic climate, and self-expression. Therefore, it could be said that attitude and achievement were significantly correlated on five of the six attitude variables in this study.

Discussion

The general lack of association between the independent variable, "innovative," and the desirable student attributes of positive attitude toward the school environment and high achievement, if truthful, will come as a painful blow to the many teachers and administrators who are expending so much effort to implement the "New Design" or Trump Plan, namely, flexible schedules, with instructional provision for large group instruction, small group instruction, independent study, and team teaching.

It seems that large size was more often associated with worthwhile student outcomes. Not surprisingly, I.Q. and achievement (as measured by the ITED and GPA) were also significantly correlated.

It should be made very clear, that no conclusion on causal relationships is drawn in this study of the effects of organizational and methodological change in Iowa secondary

schools. Several explanations come to mind from these findings. First, it is very likely that student and teacher behavior and activities are quite similar in each of the schools examined, despite the classification of "innovative" or "non-innovative" attached for purposes of analysis.

Those who have had the most experience at trying to change how teachers teach and how children learn now realize that it is difficult to change teacher performance. Teaching has been, and essentially remains, a rather personal and private business. No matter what administrative changes are made in class size, contacts per week, or cycling of contact length, teachers seem to cling to their old routines.

An alternative explanation might be that, because of the selection of the non-innovative schools strictly on the basis of similar size, three quite outstanding conventional schools were selected, schools that would always be tough competition for any innovative pair-mate.

One might also speculate that the general theoretical framework of the innovative school, with its stress on individualized and humanized education, might lead to the fostering of attitudes and values that place less importance on rank in class, grade point average, traditional academic climate and self-expression through competitive achievement. Such an educational philosophy might promote an intellectual climate and a type of aspiration level found to be associated

with the "innovative" class of schools in this study. The fact remains, we don't know.

Several ancillary points should also be made. First, larger school sizes generally were associated with desirable student characteristics. Smaller schools had lower ITED scores, and lower attitude scores; they did, however, award significantly higher grades. A second point bears on the relationship of I.Q. to attitude and achievement. As would be expected, I.Q. and achievement were positively and significantly correlated; so too were I.Q. and attitude toward school. The low ability students had poorer achievement scores and less desirable attitude scores.

A final footnote to the study seems most appropriate for this decade's concern over women's liberation. The females had significantly higher grade points, and in the large schools, a higher aspiration level score than did the males. Low I.Q. females had significantly higher attitude scores than did high I.Q. females in the innovative schools. Nonetheless, the males in each type of school had higher self-expression scores than did their female classmates.

Limitations of the Study

Certain limitations must be imposed before utilizing the results of this study. They are as follows:

1. Schools used in the study were selected only on the basis of size and innovative practices used during the

1968-69 school year. The innovative schools were using team teaching, large group instruction, small group instruction, modular scheduling, and independent study. Non-innovative was the label given to pair-mates, chosen on the basis of similar size, that had not adopted all of these practices.

2. The sample included males and females in grade twelve only, during the 1969-70 school year.

3. The students were categorized into two groups of I.Q.: (1) below 580, and (2) 580 and above. (On a converted scale this was roughly above and below an I.Q. of 110-113).

4. No attempt was made to measure change or improvement of attitude or achievement. All measures were taken at a point in time.

5. Teachers of two districts refused to complete the attitude scale, thus precluding a comparison with student attitudes toward the school environment.

Recommendations for Further Research

The following recommendations are made for further research:

1. A study to determine if innovation improves attitude and raises the level of achievement of students, over time, using a pre-test and post-test design.

2. An in-depth study of innovative and non-innovative schools comparing teacher attitudes.

3. Studies of students in innovative and non-innovative

schools to determine if socio-economic background has a significant effect on attitude and achievement.

4. An investigation designed to explore the effect of teacher attitude on student attitude and achievement.

5. A study of the drop-out rate between innovative and non-innovative schools.

6. A study of the effect of administrative behavior on student attitudes.

7. A follow-up study of the same group of students on their attitudes in five years time.

8. Research designed as a predictive study rather than an exploratory study on innovative and non-innovative schools, comparing attitudes and achievement.

9. An investigation to determine the causes for significant difference between schools on the attitude and achievement variables.

10. Studies to determine the effect of teachers' attitudes upon the attitudes of students.

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APPENDIX A: I.Q. CONVERSION TABLE

I.Q. Conversion Table

I.Q.	Converted I.Q.	
	Otis*	LT, HN, CTMM, P-C, S.B., KA, SRA-PMA**
151	---	819
150	---	813
149	---	806
148	---	800
147	---	794
146	883	788
145	875	781
144	867	775
143	858	769
142	850	763
141	842	756
140	833	750
139	825	744
138	817	738
137	808	731
136	800	725
135	792	719
134	783	713
133	775	706
132	767	700
131	758	694
130	750	688
129	742	681
128	733	675
127	725	669
126	717	663
125	708	656

I.Q. Test	$\bar{x}$	s
Otis	100	12
LT, HN, CTMM, P-C S.B., KA, SRA-PMA	100	16

*Otis - Beta and Gamma
**KA - Kuhlman-Anderson
LT - Large-Thorndike
HN - Henmon-Nelson
CTMM - California Test of Mental Maturity
P-C - Pintner-Cunningham
S.B. - Stanford Binet
SRA-PMA - Science Research Associates, Primary Mental Ability

I.Q. Conversion Table (continued)

I.Q.	Converted I.Q.	
	Otis	LT, HN, CTMM, P-C, S.B., KA, SRA-PMA
124	700	650
123	692	644
122	683	638
121	675	631
120	667	625
119	658	619
118	650	613
117	642	606
116	633	600
115	625	594
114	617	588
113	608	581
112	600	575
111	592	569
110	583	563
109	575	556
108	567	550
107	558	544
106	550	538
105	542	531
104	533	525
103	525	519
102	517	512
101	508	506
100	500	500
99	492	494
98	483	488
97	475	481
96	467	475
95	458	469
94	450	462
93	442	456
92	433	450
91	425	444
90	417	437
89	408	431
88	400	425
87	392	419
86	383	412
85	375	406

I.Q. Conversion Table (continued)

I.Q.	Converted I.Q.	
	Otis	LT, HN, CTMM, P-C, S.B., KA, SRA-PMA
84	367	400
83	358	394
82	350	387
81	342	381
80	333	375
79	325	369
78	317	362
77	308	356
76	300	350
75	292	344
74	283	337
73	275	331
72	267	325
71	258	319
70	250	312
69	242	306
68	233	300
67	225	294

APPENDIX B: SCALES OF THE HIGH SCHOOL CHARACTERISTICS INDEX

Scales of the High School Characteristics Index

Environmental Press	Student Behavior
1. Abasement-Assurances	Self-depreciation vs. self-confidence
2. Achievement	Striving for success through personal effort
3. Adaptability-Defensiveness	Acceptance of criticism vs. resistance to suggestion
4. Affiliation-Rejection	Friendliness vs. nonfriendliness
5. Aggression-Blame Avoidance	Hostility vs. its inhibition
6. Change-Sameness	Flexibility vs. routine
7. Conjunctivity-Disjunctivity	Playfulness vs. disorganization
8. Counteraction- Inferiority Avoidance	Restriving after failure vs. withdrawal
9. Deference-Restiveness	Respect for authority vs. rebelliousness
10. Dominance-Tolerance	Ascendancy vs. forbearance
11. Ego Achievement	Striving for power through social action
12. Emotional-Placidity	Expressiveness vs. restraint
13. Energy-Passivity	Effort vs. inertia
14. Exhibitionism-Inferiority Avoidance	Attention seeking vs. shyness
15. Fantasied Achievement	Daydreams of extraordinary public recognition
16. Harm Avoidance-Risk Taking	Fearfulness vs. thrill seeking
17. Humanities-Social Studies	Interest in the humanities and social sciences
18. Impulsiveness-Deliberation	Impetuousness vs. reflection
19. Narcissism	Vanity
20. Nurturance-Rejection	Helping others vs. indifference
21. Objectivity-Projectivity	Detachment vs. superstition or suspicion
22. Order-Disorder	Compulsive organization of details vs. carelessness

Scales of the High School Characteristics Index (continued)

Environmental Press	Student Behavior
23. Play-Work	Pleasure-seeking vs. purposefulness
24. Practicalness-Impracticalness	Interest in practical activities vs. indifference
25. Reflectiveness	Introspective contemplation
26. Science	Interest in natural science
27. Sensuality-Puritanism	Interest in sensory and aesthetic experience
28. Sexuality-Prudishness	Heterosexual interest vs. their inhibition
29. Supplication-Autonomy	Dependency vs. self-control
30. Understanding	Intellectuality

APPENDIX C: THE MEAN AND VARIANCE BY SCHOOL FOR EACH OF THE 30 SCALES OF THE HSCI

The Mean and Variance by School for Each of the 30 Scales of the High School Characteristics Index

Innovative Schools

	A		B		C	
Scale	$\bar{x}$	s	$\bar{x}$	s	$\bar{x}$	s
1	4.09	3.81	4.49	4.45	5.33	3.78
2	5.31	2.71	5.19	2.95	5.46	2.70
3	4.30	2.82	4.85	1.95	5.11	2.32
4	5.65	3.65	5.63	3.95	7.15	3.78
5	4.17	3.64	3.89	4.16	4.02	4.24
6	5.94	2.21	5.74	2.40	5.33	2.31
7	5.98	4.52	5.64	4.26	5.76	3.47
8	6.12	2.36	6.09	2.82	4.85	2.53
9	4.03	2.78	4.08	1.95	5.04	2.84
10	5.93	3.60	6.58	2.74	5.83	3.12
11	5.63	4.13	5.12	3.87	4.87	2.60
12	5.24	2.82	5.50	2.60	5.80	2.03
13	4.57	3.30	4.87	4.56	4.78	3.31
14	5.80	3.33	5.57	3.86	5.83	3.35
15	4.83	2.71	4.86	2.28	4.41	2.38
16	3.67	2.13	2.69	1.77	3.48	1.77
17	4.16	2.86	3.32	2.71	2.69	2.06
18	5.97	2.60	6.28	3.20	5.76	3.21
19	5.36	3.85	6.35	3.27	7.04	2.44
20	4.79	3.71	3.46	3.41	3.76	3.10
21	6.21	4.68	5.65	4.73	5.74	5.35
22	5.10	2.52	4.05	2.70	5.04	2.04
23	5.93	2.86	6.32	3.45	7.57	2.92
24	5.98	3.03	6.85	2.44	7.30	1.68
25	5.56	3.06	4.84	2.86	5.24	2.27
26	5.78	2.76	4.03	3.15	3.51	2.76
27	5.35	3.38	5.10	2.63	3.93	2.15
28	6.64	3.82	7.30	3.81	6.72	2.43
29	4.77	3.60	4.73	3.72	4.62	4.42
30	5.75	2.73	5.47	3.33	4.91	2.97

The Mean and Variance by School for Each of the 30 Scales of the High School Characteristics Index

Non-Innovative Schools

	D		E		F	
Scale	$\bar{x}$	s	$\bar{x}$	s	$\bar{x}$	s
1	4.49	4.27	4.11	4.00	5.06	6.47
2	5.95	2.97	5.70	2.46	4.58	2.90
3	4.49	2.48	4.28	2.22	4.94	2.63
4	6.33	3.75	6.70	1.97	4.56	3.44
5	3.09	3.64	2.41	1.99	4.53	3.34
6	5.23	2.60	4.18	2.70	4.54	2.17
7	5.71	4.79	6.34	4.12	5.46	5.15
8	5.98	3.10	6.56	2.71	6.28	2.08
9	3.87	2.43	4.65	1.59	3.88	1.94
10	6.35	3.69	5.84	4.57	6.24	3.57
11	5.90	3.92	5.81	3.84	5.24	4.02
12	5.21	2.97	5.44	2.59	5.38	2.98
13	4.87	4.78	4.93	3.65	3.35	3.69
14	5.98	3.54	5.90	3.10	4.72	2.94
15	4.55	2.55	4.59	2.51	4.50	2.58
16	2.73	1.38	3.19	2.00	3.04	1.50
17	3.75	3.79	3.68	3.70	3.15	3.15
18	6.03	2.37	5.69	2.98	6.32	2.34
19	6.52	3.31	7.41	2.74	6.16	2.59
20	4.91	5.07	4.10	3.53	2.95	2.09
21	6.00	6.32	6.61	5.40	5.43	6.63
22	5.12	2.40	6.41	1.54	4.54	3.19
23	6.70	3.29	6.64	2.38	5.78	2.83
24	6.44	2.79	6.81	2.54	6.72	3.31
25	4.98	3.76	5.10	4.06	4.94	3.12
26	5.28	3.08	5.17	2.87	3.84	3.85
27	5.99	3.91	3.88	2.78	4.18	2.27
28	6.29	3.51	5.94	3.89	6.60	3.76
29	3.87	3.50	4.73	3.64	3.60	3.61
30	5.34	3.49	4.91	2.98	4.56	3.07

APPENDIX D: TABLE OF MEANS AND STANDARD DEVIATIONS FOR ALL VARIABLES OF THE SAMPLE

Table of Means and Standard Deviations for All Variables of the Sample

Variables	Mean	Standard Deviation
1 - Innovation	1.50866	.49992
2 - Size	2.40718	.69031
3 - Sex	.50371	.58232
4 - Aspiration Level	21.31683	4.13164
5 - Intellectual Climate	23.59530	6.31894
6 - Student Dignity	17.46535	5.11248
7 - Academic Climate	8.37871	3.29230
8 - Academic Achievement	27.29950	6.64178
9 - Self-Expression	21.23886	5.39399
10 - GPA	2.50959	.74535
11 - Rank in Class	151.44059	136.45419
12 - ITED	21.19554	7.42863
13 - I.Q.	579.50248	132.41739
14 - I.Q. Group	1.58292	.49308