1972

Reactions of high, average and low ability students to four teaching-learning modes of flexible scheduled high schools in the Great Plains Area

M. Russell Mahaffey

Iowa State University

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REACTIONS OF HIGH, AVERAGE, AND LOW ABILITY 
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Reactions of high, average, and low ability students to four teaching-learning modes of flexible scheduled high schools in the Great Plains Area

by

M. Russell Mahaffey

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

Major: Education (Educational Administration)

Approved:

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In Charge of Major Work

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For the Major Area

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For the Graduate College

Iowa State University
Ames, Iowa

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CHAPTER I. INTRODUCTION

In the 1950's, the National Association of Secondary School Principals, with the aid of Lloyd Trump as the director of the Commission on the experimental study of the staff in secondary schools, pointed out the need for changing the teaching-learning modes.

The Trump plan attempted to remove two substantial barriers to improvement in the secondary school, (a) inflexibility of class schedules, and (b) poor staff utilization. The schedule would be changed to provide for three phases of instruction: presentation and assimilation, discussion, and study. The staff would be expanded to include professional teachers, paraprofessional assistants, clerks, general aides, consultants from the community, and staff specialists (20).

The Trump plan has proven easier to talk about than to implement. Under a grant from the Danforth Foundation, Lloyd Trump and William Georgiades have conceptualized a model for changing the instructional system of a secondary school. The basic goals of the Model Schools Project are as follows:

a. To provide for each pupil, regardless of talents and interests, a program for learning through which each one may proceed with gains.

b. To provide conditions for teaching that will recognize differences among teachers and capitalize on the special talents and interests of each person.

c. To identify what professional teachers must do as separate from what may be done effectively by clerks, instruction assistants, and general aides.

d. To evaluate in practice the roles of the principal and his assistants in improving the instructional program.
of the school and, in the process, to analyze the success that other persons have in managing the school.

e. To emphasize in curriculum revision the separation of those skills, facts, concepts, appreciations, and the like, that are essential for all pupils to possess in all areas of human knowledge as distinct from those learnings which are specially relevant in terms of individual talents and interests; stated differently, to separate basic education from depth education.

f. To develop better methods and materials to evaluate changed conditions for learning, teaching, and supervising, and the effects of the program on pupils, teachers and principals, and changes in the use of the things of education.

g. To utilize school funds, supplies and equipment, and other school facilities differently to produce better results as described under item f without necessarily having more of the things of education.

h. To discover better ways of utilizing outside consultant help, not only within a given school but also through audiovisual devices to spread the consultants' talents among other schools.

i. To analyze the process and the progress of change among schools with varying degrees of relationships to the project, namely, schools in each of four specified categories, plus other variables that may be discovered.

特朗普 (29) 描述了他的 MSP 计划的基本特征如下：

a. 校长将三分之四的时间用于直接与教师合作以改进教学和学习。

b. 差异化工作和其它安排产生不同的教师角色。

c. 个人化学习强调动机，持续进步，自我导向，灵活调度，个性化评估，对个体需要和兴趣的关注，以及其它类似，同时保持学生责任感。

d. 课程修订将基本，必要的学习与其它学习区分开，其它学习主要是为有特殊才能和兴趣的学生设计的。
e. Improvement of teaching and learning requires that money and facilities be utilized differently.

f. Increased emphasis on evaluation is essential to produce confidence in the changes and feedback for directing further improvements (29).

The purpose of the present investigation will be to examine the impact on the teachers and students of the schools in the Great Plains Area (Iowa, Nebraska, South Dakota, Missouri), both public and private, from the teaching-learning modes patterned after the MSP schools to which Trump alludes. Over the past decade a number of Iowa schools have attempted to implement the Trump plan, usually accompanied by a variable time schedule, computer built with consultative help from Westinghouse Learning Corporation (Measurement Research Center, Iowa City, Iowa) or one of the International Business Machines service centers in the midwest. These districts have had considerable difficulty changing the inputs of teacher behavior, space, money, and instructional materials. Moreover, they have had a difficult time answering the taxpayer-critic who asks, "Prove this way is better than a conventional high school program."

In this study the Iowa schools surveyed will be designated as "New Design" schools. The term "New Design" was originated by Robert N. Bush and Dwight W. Allen, (7) two Stanford professors, in the 1964 book, A New Design for High School Education (7). Bush and Allen were seeking ways to implement Trump's (7) ideas for scheduling Large Group Instruction (LGI), Small Group Instruction (SGI), and Independent Study (IS).
In 1961 Trump and Baynham in their book, Guide to Better Schools: Focus on Change (31) predicted that schools of the future will be characterized:

1. Some classes will be smaller
2. Some classes will be larger
3. Independent study will be emphasized
4. The three phases of instruction will be related
5. Teacher assistants will be used
6. Educational facilities will reflect change
7. Schedules will be more flexible
8. Students' individual differences will be recognized
9. Teachers' individual differences will be recognized
10. The curriculum will be reorganized
11. Evaluation will be more complex (31)

The implementation of the New Design concept for schools may take considerable reeducation and a change in philosophy on the part of boards of education, parents, teachers, and students. However, students were ready and desperately seeking changes in their education. Of the above group, the students are most ready and desirous of a change (20).

The Problem

The problem of this study is to determine and describe the impact of the various teaching-learning modes of the New Design upon students of high, average, and low ability in both public and private high schools of the Great Plains Area. The purpose of the investigation is
to discover ways to improve the implementation and program of the New Design. Specifically, the investigation seeks answers to the following questions:

1. Is there a significant difference among principals, teachers, and students in their attitudes toward Large Group Instruction (LGI), Small Group Instruction (SGI), Independent Study (IS), and Open Labs (OL)?

2. Is there a significant difference in teacher responses to the four teaching-learning modes when classified by sex, male or female?

3. Is there a significant difference in principal responses to the four teaching-learning modes when classified by sex, male or female?

4. Is there a significant difference in student responses when categorized on the basis of sex?

5. Is there a significant difference in student responses when categorized on the basis of academic ability, high, average, low?

6. Is there a significant difference in student responses when categorized on the basis of both sex and academic ability?

**Assumptions**

The assumptions for the study, stated in research form, are:

1. The New Design Schools of the Great Plains Area are using these teaching-learning modes.

2. Teachers are able to describe each of these modes and to
assess the relative impact of each.

3. The students in these New Design schools are knowledgeable enough to assess the various modes in terms of usefulness to students like themselves.

4. Cooperation can be obtained from the administrators, teachers, and students of New Design schools.

Definitions

For the purposes of this study, the terminology is operationally defined as follows:

1. New Design is used to identify the organizational structure, teaching methods, and staff utilization intended to individualize and humanize instruction at all pre-college levels.

2. LGI, Large Group Instruction, is that which, because it involves a large number of students, places primary emphasis on presenting materials with a minimum of interaction.

3. SGI, Small Group Instruction, is that in which the primary emphasis is on face-to-face contact and group interaction.

4. IS, Independent Study, is instruction in which the student engages in activities independent of other students and in large part independent of immediate teacher direction. This also takes into account individualized learning tasks and learning rates. It allows students to work on self-initiated learning tasks.

5. Open Labs, OL, include those physical facilities for which special equipment and tools are needed to enable students to
work independently and in small groups and to practice skills, to experiment, and to apply ideas suggested in large group instruction.

6. Flexible Scheduling refers to the master schedule that will provide for LGI, SGI, IS, and OL.

Delimitations of the Study

The study was limited to thirty-four Senior High Schools within the Great Plains Area. The states in the Great Plains Area include Iowa, Missouri, Nebraska, and South Dakota. All of the schools in this study have the following characteristics:

1. Have a variable time schedule with provisions for L GI time, S G time, and Independent Study.

2. That are part of a public or private school district in the Great Plains Area.

3. That have used this approach for at least one complete school year.

Sources of Data

All data for this study was obtained from questionnaires mailed to the following kinds of respondents: principals, teachers, and senior students. Items on the questionnaire were devised using the Certainty Method, devised by Warren, Klonglan, and Sabri (34).
CHAPTER II. REVIEW OF LITERATURE

The "New Design" is a relatively new term to describe changes in the instructional system. At the present time a number of schools are implementing the concepts of Large Group Instruction, Small Group Instruction, Independent Study, and Open Labs, but only limited research has been done in regard to the success of these learning modes. Due to the fact that there are limited studies on the reactions of students, teachers, and administrators to New Design schools, this review will also include suggestions from the literature as to how the different learning modes of the New Design can best be utilized. The related literature on the four modes of instruction will be reviewed separately in sections. The last section will consist of reactions to the New Design concept as a whole.

Large Group Instruction

Large Group Instruction has been defined in the previous chapter as a teaching–learning mode which places primary emphasis on presenting materials with a minimum of interaction. The material may be presented by means of lecture, films, guest speakers, T.V. viewing, drama, guide sheets, and so on. Large groups are also used for testing and reading.

Manatt and Meeks (20) have stated three guidelines for the use of LGI:

Use LGI when:

1. A large group mode would be more conducive to the desired outcomes.
2. An LGI mode will be about as productive for but more economical of teacher–pupil time, space, and
3. when you are converting teaching and learning as a temporary expedient.

Large group size will of course depend upon school enrollment. But Trump (30) suggests that large groups of the future will consist of groups of one hundred or more students. He cites the following activities to be undertaken before these large groups:

<table>
<thead>
<tr>
<th>Introduction</th>
<th>New topics, units, and concepts are introduced and placed in relation to other knowledge. Purposes are presented. Preparation for learning is developed.</th>
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<tr>
<td>Motivation</td>
<td>Reasons for study are understood. Interest is stimulated. Students are assisted in self-analysis of present knowledge.</td>
</tr>
<tr>
<td>Explanation</td>
<td>Understanding of terms and concepts is further developed. Questions by students and teachers are raised and answered.</td>
</tr>
<tr>
<td>Exploration</td>
<td>Identification of the range of possible learning activities is provided. Interests are amplified. Problems to be solved by students are considered.</td>
</tr>
<tr>
<td>Planning</td>
<td>Decisions are made regarding learning activities. Methods of study are planned.</td>
</tr>
<tr>
<td>Group Study</td>
<td>What has been learned is shared by use of buzz sessions, panels, and other group techniques. Drill, memorization, problem solving, and organization devices are practiced.</td>
</tr>
<tr>
<td>Enrichment</td>
<td>Content not readily available to students is introduced.</td>
</tr>
<tr>
<td>Generalization</td>
<td>Understandings and appreciations are developed. Concepts that can be transferred to other situations are summarized.</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Knowledge, appreciations, skills, and generalizations are measured prior to</td>
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study, during study, and at the conclusion of the activity. A variety of evaluative techniques are utilized.

In New Design Schools large groups will be teacher centered and will occupy approximately forty percent of the students' time. The number and length of large groups will vary depending on the subject, what stage of the subject is being studied, and the interest and maturity of the students (30).

Although LCI is relatively new, there have been some efforts to obtain reactions to the learning mode from teachers, students, and administrators. Speckard (27) concluded from questionnaires administered to teachers and students in an experimental school that large group instructions help conserve teacher time thus enabling the teacher to spend more time with students on an individual basis. Students gained experience in organizing and recoding lecture materials. Some of the teaching problems involved were lack of time to prepare audiovisual materials, difficulty in maintaining the attention of the students, and ineffectiveness of lecture for students from differing ability levels.

The LCI mode has shortcomings, especially if formal lectures predominate. Complaints of students included lack of variety of presentation, little opportunity to ask questions, and keeping up with teachers.

Eugene Balk (4) in an evaluation of the Biology course at Mason City High School involving low achievers stresses the difficulty of maintaining students' interest in large groups.
Beggs and Buffie (6) state that research on attention span of adolescents indicates that the effectiveness of instruction decreases as the length of the presentation increases.

Hoover (16) gives the following suggestions regarding length of lecture:

1. The informal lecture seldom (should) exceed fifteen or twenty minutes.
2. The length of the presentation prescribed in a prearranged schedule is usually forty to sixty minutes.

Trump and Miller state that most schools utilizing LGI allow approximately forty minutes while some schools use an hour and others twenty-five minutes (32).

Alcorn (1) gives these suggestions for making "teacher talk" or lecture more effective:

1. Lectures for secondary school students should usually be short. One of fifteen or twenty minutes is possibly the maximum, and in most cases five or ten minutes may be better.
2. The approach to the lecture should be informal. The language should be clear and simple, not stilted.
3. Lectures should be tailored to people, and in the high school the teachers must not forget that the audience is one of adolescent boys and girls.
4. Lectures should be related to students' backgrounds, knowledges, skills, and interests. If they are not, the students are soon "lost".
5. Lectures should not rehash textbooks or other readings which the students have done, or should do for themselves. The lecture should present new and fresh ideas not readily available.
6. Lecturers should avoid reminiscences or discourses on trivial personal incidents.
7. Lectures should be planned and organized so that they do not digress. In the main, the teacher should announce his purpose at the beginning of the lecture. Then, its development should stick to the theme.
8. Talks should be replete with verbal illustrations.
9. Frequently, lectures are improved if supplemented by simple visual aids such as specimens, flat pictures,
or chalkboard sketches.

10. Many students, especially in the advanced classes, will be going to college. They should be told that lecturing is customary at the college level, and that some practice in learning from this technique while still in high schools is in order.

11. The relatively long lecture should include a summarization at its close.

12. The teacher should give the class instruction in taking simple notes in organizing verbal material. Students should learn to review these notes and to make them part of their cultural growth.

Manatt and Meeks (20) suggest the following guidelines for the large group teacher:

1. Large group sessions should be kept short.
2. The relationship between LGI and the SGI to follow should be explained.
3. Physical arrangement—all must be able to see and hear.
4. Only a few main concepts should be covered.
5. Use a multi-media approach.
6. Do not use LGI to do better what shouldn't be done at all.
7. In a team teaching situation, no one teacher should monopolize LGI.
8. Use LGI time only to
   (a) introduce topics and concepts,
   (b) build interest and motivate,
   (c) entertain—still a very important part of teaching and learning,
   (d) evaluate and make assignments, and
   (e) provide anything all students need that can't be provided any other way.

The role of the student in LGI has also received attention. One of the goals of LGI is to develop the listening and note-taking skills of students. Trump and Baynham (31) suggest that through LGI students will learn to take notes, hold back questions until an appropriate time, and develop more responsibility for planning their own learning.
Beggs and Buffie (6) also state the need for developing good listening habits and increasing the ability to sort out important facts. LGI is the learning mode suggested.

Manatt and Meeks (20) have concluded from visiting over three hundred innovative schools that LGI is not given the emphasis or the time that it was at the outset of the New Design program but it is still essential. It provides a means of disseminating information important to all students in the least amount of time.

Small Group Instruction

Small Group Instruction refers to a teaching–learning mode involving a relatively small group of students (usually no more than fifteen) who are engaged in face to face contact and group interaction. In his evaluation of SMI, Allan A. Glatthorn, Principal of Abington High School in Pennsylvania states:

Let me begin by stating flatly that the small group is one of the most important educational innovations to be discussed at this conference. We could survive without the large group. We could manage without the complexities of the flexible schedule. But without the small group we would inevitably fail in our educational task. The reason is simple: it is only through small group that we can multiply the opportunities for pupil–teacher interaction. And very significant kinds of learning take place only through such interaction.

This interaction becomes of prime importance for the student. He learns best when he is involved actively in the learning process, and the small group most effectively provides for such involvement. In the small group the student is seen as the individual learner—he cannot be ignored, he cannot get lost as a passive listener. The shy student finds himself more at ease and gradually begins to speak up
and opens up to the few who are with him. The talkative student who enjoys impressing a large class feels a bit different when five or six are sitting with him in the quiet of a seminar room, and he begins to listen. And the students are perceptive of the value of the small group. Frequent surveys of student opinion reveal overwhelming student approval of the small group as a learning environment (13).

In research done on the effect of class size on learning, Martin N. Olson (23) executive secretary, Associated Public School Systems, found that class size was a particularly high predictor of quality instruction. In analyzing data collected from nearly twenty thousand public school classrooms, Olson concluded:

Of major importance was an analysis of the strongest predictors in various combinations which produced results for certain subjects and certain styles of teaching activity that were not influenced by class sizes, and vice versa. The analysis of tabled data for 1,103 variable groups led this investigator to conclude that school system administrators and teachers should place major emphasis on varying class sizes to fit the unique needs of particular subjects with a careful view toward realistic well-defined purposes for the various styles of educational activity. Undoubtedly the proper combination of circumstances would produce great numbers of classroom performance scores surpassing even the highest found in this study (23).

Of course the findings of this study apply only to A.P.S.S. schools. The magnitude of the study and the fact that most states in the nation were included indicate that the findings are quite representative of American education (23).

Manatt and Meeks (20) point out that SGI is a student centered approach to learning, not merely a specified number of students. They also state that learning in small groups is related to the opportunity
for each student to participate. Naturally as the size of the group increases this opportunity to participate decreases. Thus they recommend that small groups be limited to a maximum of fifteen students; or five would be better. They also suggest the following advice for the small group teacher:

Essentially, in small group discussion, the students will talk with each other about what they learned from LGI sessions, from personal experience, and from independent study. The teacher will be tempted to relecture and take over—but be patient, the discussions will use and reinforce some of the knowledge the students gained in LGI. If you break in too soon to correct misinformation, you may deny one of the students opportunities to play an "explainer" role (20).

The instructor and students must learn different behaviors if they are to achieve the purposes of small group instruction. In the Experimental Studies of the Utilization of the Staff authorized by the NASSP, Trump and Baynham (31) reported the following:

Achievement of the purposes of very small classes was not easy in the experimental studies sponsored by the NASSP Commission. Teachers and students both tended to act in much the same manner they customarily did in classes of 25 to 35. For example, teachers sometimes remained standing by a portable blackboard giving directions, asking questions, and writing answers during much of the period. As many as one-half of the students in several observed instances never contributed an idea during the entire period even though there were only 10 to 15 of them in the group. Most of the time was spent by the teacher in asking questions each answered by one student without discussion among students. No wonder the potential gains for students in small classes were limited and, in fact, did not exceed those in larger classes when control groups were used in some of the studies.
Trump and Baynham expressed that given time, students and teachers will learn how to act in small discussion classes. They will learn to express ideas, listen to others, and understand and criticize ideas. As in any task it will be more difficult for some teachers and students to alter their behavior than others (31).

Donald DeLay (10) of the Stanford University School of Education cites the need for the teacher to respect each student. Errors should be corrected subtly without open rebuttal. Delay also states that the communication in the small group exists on both verbal and non-verbal levels. Inflection, tone, emotion, and context contribute added meaning to verbal statements. Non-verbal behavior such as nervous movement and facial expression may convey thoughts and feelings more clearly than a statement. With experience the teachers and students can become more aware of this type of communication. Through this awareness they become more sensitive to individual needs.

DeLay states in regard to learning attitudes:

Students lose many of their psychological and social inhibitions as small group exchange opens up, and adopt more positive attitudes towards learning in general. A positive self-concept and self-esteem are basic to a positive attitude toward learning. The power of small groups to change the individual's self-concept has been applied in psychotherapy for a long time. There is no reason to expect a different response from "normal" students in a small learning group. The common thread through all types of small groups is strong communication, a factor that makes small group techniques especially meaningful in psychotherapy. Is strong communication less valuable in education?

In the functioning small group the student finds much more opportunity to become involved in open and "real" discussion. He interacts out of personal
feelings for the group (his peers) and respect for his own investment in the group-determined task. His motivation is not based on fear of failure, teacher sanction, or a grade, but is intrinsic. He is no longer "playing the game" of school. From his concern for group opinions and sensitivity to their modes of communication, he derives a capacity to modify and refine his position. He can apply his own knowledge freely to solving group problems. The small group brings more data to bear on problems, and probes and questions more deeply, and assumes a more critical posture. In short, the functioning open group enhances the task oriented learning potential (10).

The teacher behavior in the small group is determined by what process of learning is used. The process should never be teacher-centered. Teacher participation should be minimal whether the group is debating, reporting, or brainstorming.

To develop the learning potential of the small group the teacher must be warm and sensitive. He must be willing to abandon some teaching modes and adopt others more suited to SGI (10).

DeLay (10) reported after visiting five small group sessions in a school which has utilized SGI for two years that the content of each group differed. After his observations, each teacher was interviewed. From his observations and discussions with the teachers involved, he concluded that simply believing in SMI as a teaching-learning mode will not change teacher behavior in the classroom. The change in behavior will only come through experience and conscious effort (10).

Independent Study and Open Labs

One of the chief characteristics of American education in the
last quarter of the twentieth century is the trend toward individu­alization. Individual differences have always been present in schools, but not until recently did many schools try to deal with them by changing curricula or the instructional setting to help each student learn as much as his potential allows. A recent article of the IDEA Reporter stated:

Today the burden of instruction has shifted from student to school. Education is no longer a matter of the school's saying in effect, "We'll provide what children need to learn—but it's up to them to take advantage of the opportunity." Now society is saying, "Every child has some ability; it's up to the schools to find out what that ability is and help develop it" (36).

Beggs and Buffie (5) suggest that Independent Study is one of the ways that instruction can be individualized. They perceive IS to be a mode of learning where the student works on a certain idea or body of knowledge and masters it at his own rate. IS allows a student to develop his own personal abilities as an individual without constant supervision, interacting with others only when he needs to do so. In discussing the theory of IS Beggs and Buffie state that the student performing effectively in IS will be one who:

1. Perceives worthwhile things to do.
2. Personalizes learning.
4. Makes use of human resources.
5. Makes use of material resources.
6. Produces results.
7. Strives for improvement (5).

It is hoped that experiences like these will lead to the development of self-directed learners. Alexander and Hines (2) in discussing IS comment that education should be a process by which students gradually
become independent and carry on their own learning after formal schooling has ended.

Although research on Independent Study is limited, some reactions have been gathered. A project at the University of Chicago Laboratory School designed to develop independence among its freshmen students was undertaken by the principal, Williard J. Congreve, and his staff. The project initially involved only forty-two students in two subject areas (World Geography and Earth Science). The two teachers worked individually with the students to help them define areas of study. The students then worked on projects independently consulting the teachers when the need arose. They were required to attend one large group a week in each subject area. Congreve (9b) reported that some students were so interested in their projects that they handed in fifty to seventy-five reports on their findings. He also concluded that the teacher seemed to have a new role in this type of learning mode. The students viewed the instructor as a resource person who could assist them in learning.

The next year the project was extended to the entire freshman class of one hundred seventy-five students in four subject areas. Classes met regularly three times a week. The other two days were reserved for independent study. After a few weeks it was obvious that there were some students who were not using the IS time constructively. Therefore, after two marking periods, the plan was modified. The project was changed to include three programs. Type I consisted of four or five classes per week that were primarily teacher directed.
Type II was the same plan originally outlined, and Type III involved one required class meeting a week. Activities here were student planned and student directed. The majority of the students selected Type II to continue their study.

From data collected from the first year Congreve (9a) concluded that the selection of learning program (Type I, II, or III) was related to ability. Those students of higher ability chose the most independent programs and did the best work. Students of lower ability chose to stay in a teacher centered atmosphere; yet still received low grades.

Responses on questionnaires administered to students showed that their personal reactions to the project ranged from enthusiasm to disgust. In open comments some students stated that the program did not allow them enough freedom; while others felt it was much too permissive. One of the most frequent complaints by students was that the program seemed to lose its freshness and interest as the year wore on. Other responses were more encouraging. A majority of the students felt that the program had helped them discover new things about themselves and their study habits. Some freshmen students commented at the end of the year, that the project had been the most vital learning experience in which they had ever been involved. In summarizing the data collected from the first year Congreve stated:

1. Students with the highest achievement and greatest ability elect programs which permit them to work more on their own, while students with the lowest achievement and ability elect programs which provide them more direct guidance by the teacher. Until some better ways of defining and measuring behaviors related to independence in the various subject-matter
fields are developed, we cannot seem to separate, at least from our experience, students who thrive under an atmosphere of so-called independence from those who have high intelligence or high capacity for learning academic subjects and who concomitantly achieve in school at a high level.

2. In spite of the long-held notion about teen-agers desiring freedom to work out their own destinies, when given the opportunity to plan their programs, to select modes of study and to take the consequences for these selections, only about half of the freshman students in a high ability student population really are comfortable with such a situation and wish to have it continue. A sizable percentage of them (about fifteen percent) are so uncomfortable with this situation that they react almost violently against the idea after having been subjected to it. On the other hand, a similar percentage (again about fifteen percent) are tremendously enthusiastic about the program and feel cheated when such opportunities are terminated.

3. There seems to be no relationship between the amount of class time students spent with a teacher and the amount they learn. Despite the fact that the Type III students had the most infrequent class meetings these students received the highest grades and made the greatest gains on pre- and post-test data. Of course, they were also the brightest students and therefore undoubtedly got the most out of the class experiences which they had with the teachers.

4. In addition, we discovered that even with one hundred seventy-five students, it was possible to organize and operate a program where students had a considerable amount of freedom and not have the school disintegrate for lack of order. We also discovered that teachers can work together in developing programs far more complicated than administrators have ordinarily dared to tackle and that when teachers do have complete control over the instructional process, they will find solutions to organizational problems which are closer to meeting the needs of the learning situation (9).

At Lakeview High School, Decatur, Illinois, almost a third of each student's day is devoted to independent study. The school also
employs flexible scheduling and team teaching (12).

Selection of students for IS at Lakeview is not on the basis of ability. It involves high, average, and low ability students. The student must present a proposal for an IS project to his small group teacher.

At the time of the review of this project fifty-five percent of the students were engaged in IS in a wide variety of projects.

Some student reactions to the program are listed below:

Bill Wolfe (Sophomore)—I am studying the life and writings of Ernest Hemingway at present. I have completed a number of projects this year including an analysis of "Ulalume" in English and a study of France from 1896 to 1919 in history.

The independent study program has broadened and stimulated my reading. The length of some of the topics has made conciseness and ability to grab the fundamentals very important. I think it has helped my self-discipline to a certain extent.

William Puller (Senior)—I am building a cloud chamber in physics and have completed a written project on the science of high explosives. I have developed a number of explosives in my laboratory at home.

The independent study program is O.K. It's the best way to get added knowledge on a subject.

Adrienne Reynolds (Sophomore)—I am working on a project in world history which will take me into the realm of ancient man and his movements. This will also deal with the formation of civilization and various geological aspects. (I plan to go into this field of study in college.)

In English, I have a tentative plan for a project on World War I and what it was like. This will include personal "eyewitness" reports from my grandfather who was in almost all of the major campaigns in France. I have completed a project in English on the origins of various expressions which came about because of personality quirks.
of certain people and why.

I think that the independent study program has basically a good beginning in our school. I think that it should include everyone regardless of ability because the students learn to complete a job independently. I think the program should include visits to research institutes that have an area of reference in the particular subject one has chosen. It might also include work over the summer for the students who are really interested in the subjects they have chosen. For instance, suppose a student is interested in archaeology, perhaps there would be someone interested enough in him to have a summer "job" on a "dig" to gain experience and to find out if he is really interested in that type of work.

George Taylor (Freshman)—I am not working on a project at present, but I have completed one in group guidance, one in English on mythology and one in science on biographies of famous men in electronics.

I think the independent study program is tremendous.

Bonnie Baker (Sophomore)— The Life and Works of Walt Whitman is my eighth project this year. Others include: The Political Parties of France, the Economy of France, the Mysteries of Psychology, America's Racial Problem, the Evils of Daydreaming, the Life and Works of Washington Irving, and a special report on Gunnar Myrdal's "An American Dilemma."

In my opinion the independent study program is the ideal way to educate young people. It gives the individual student the opportunity to do research at any time. There is always help available from the teacher (12).

Some comments made by teachers involved in the program are given below:

Mr. Robert Flaugher (Boys' Physical Education)
Independent study develops within the students the ability and desire to keep on learning after the completion of their formal schooling. I don't believe it has even begun to grow to its potential; however, strides are
being made in that direction.

Mr. David Rayhill (Industrial Arts)—I think the concept is ideal, and implementing it in the industrial arts area is not difficult. We have boys working on programmed learning texts in electronics, and most of those enrolled in regular courses are working on individual projects in the shop.

Mrs. Marilyn Fleener (Home Economics)—The concept of independent study is good, generally—particularly, excellent in home economics. Students should not be pushed into independent study in all areas.

Miss Arline Stokes (English)—Independent study is an excellent plan by which students can explore and develop topics of genuine interest to them. Because the student is stimulated toward the completion of self-determined goals, the results of independent study surpass in many cases the student's previous achievement level. Through independent study, flexibility of curriculum and allowances for individual differences enter the school program (12).

In the first half of the sixties, James D. Wells (35) made a study of three hundred and eighty-eight secondary school students who were engaged in IS in twenty-four schools east of the Mississippi. In analyzing student responses to questions pertaining to their satisfaction with IS he found that younger students were the least satisfied. Wells suggested that the reason for this may be the younger students' lack of experience in experimentation. Older students are more adept at researching; therefore adjusting to IS is easier for them. The findings of this study also showed that students in nonacademic subject areas such as Home Economics, and Industrial Arts were more satisfied than those in academic areas. Those students involved in vocational work experience were the most
satisfied of all the students surveyed. Students who had been involved in IS programs for the longest periods of time were by far the most satisfied. A large majority of the students in the study wanted to continue in IS (35).

In a Curriculum Report from the NASSP in May, 1967, an investigation by Alexander and Hines and associates, and the evaluations of IS conducted at the University of Illinois High School, and in the Dade County, Florida High Schools, as well as at the University of Chicago Laboratory School were used in making these evaluations:

1. It is said that: Independent study provides for needs and interests of the individual. The 300 teachers were practically unanimous in saying that this is true. Student testimony confirms this. Problem students and low-achievers have responded favorably in a number of schools, and independent study opportunities have appeared in several schools to reduce dropout rates. Independent study has contributed significantly to the development of salable skills on the part of many youngsters who are following a vocational program.

2. It is said that: Independent study allows boys and girls to follow topics or interests not represented at all or not fully in the regular curriculum. A few unusual projects seen recently will demonstrate how far beyond the "regular curriculum" independent study can take a high schooler when the academic climate is right and resources are at hand: (1) Making applications of digital computers to engineering problems, (2) studying the effects of verbal reinforcement on generalization, (3) developing a program for computer translation of a language, (4) third-year, college-level Chinese, (5) composing and performing original musical compositions, (6) conducting a longitudinal sociological study of a community, (7) adapting a novel for a dramatic performance, (8) producing
a radio program aired weekly over a local commercial radio station.

3. It is said that: **Independent study improves student performance beyond high school.** Not enough dependable and relevant data are at hand to permit a firm position on this claim. When students who had been involved in the Dade County Laboratory Research project were followed up, they were found to be doing extremely well in college, but no comparison was made with a similar group of young people from the regular program. Most other follow-up attempts have had similar weaknesses (18).

Richard Stauffer (28), principal of LaDue, Missouri, reported that students engaged in IS admitted wasting some time but felt that overall they accomplished more. They enjoyed working at individual rates and taking examinations when they felt they were ready. They also expressed satisfaction with the freedom they were given to frequent laboratories and study areas according to their need.

Independent study requires that there be facilities in the school where students can pursue an interest or complete assignments. These facilities may include: Resource Centers, which may house books, magazines, records, tapes, films, maps, calculators, and teaching machines; Learning Centers with carrels for individual study in schools with enough space to afford them. These areas replace the traditional library and study hall (20).

Open Labs are another facility that aid students in independent study. Manatt and Meeks (20) define Open Labs as follows:

"Open labs" are areas in which there are no scheduled classes. In this case, the teacher may want to open the room for students who are on IS to work, experiment and study. This may or may not be under the direct supervision of
the teacher. In all cases common sense should determine whether an open lab possibility exists and whether it will be directly supervised or unsupervised.

Lab work basically is defined as some kind of physical activity; therefore, subjects such as typing, science, physical education, homemaking, art, shop, reading, foreign language, driver education and music might provide the open lab opportunities for students who are on their IS time. In addition, there are times when a regular lab is scheduled but is not used to capacity; consequently, the teacher will then permit students to come in during their IS time to use the facility. Hence, a regularly scheduled class may be in session while there are some students who are on IS using the same room (20).

Reactions to the Outcomes of the New Design

During the sixties there were many innovations proposed in American education. Also much money from government and private sources was granted to encourage the various innovations. The New Design includes many of these innovations; large group and small group instruction, independent study, flexible scheduling, and others. The percentage of American schools implementing the New Design is small and their reactions are varied. Following are some results found in evaluating these schools.

Speckard (26) found in his study of the effects of flexible modular scheduling that good students used their unscheduled time wisely but many others wasted it. He concluded that low ability students have more problems in adjusting to a flexible schedule than average or above average students. This study was based on the use of an experimental and control high school.

Richard Stauffer, Principal of LaDue, Missouri, set up a flexible
schedule in some courses in 1967. One fourth of the high school students participated in individualized instruction, IS, and flexible grouping. Reaction by the students revealed that they liked LGI but felt that SGI was necessary to clarify the material presented in the large group. They enjoyed the interaction of the small group but mentioned that only certain students participate. They said that they enjoyed school more under the flexible program. Although they weren't sure they had acquired more learning under the new program, they believed the learning was more meaningful (28).

An indepth study of flexible scheduling at Delevan-Darien High School under the direction of Chris Poulos revealed that a majority of unscheduled time was spent by students in learning activities. A need was expressed for more space in the Library-Resource center (11).

Another study at the same school on student behavior during unscheduled time revealed that as students advance in school, their unscheduled time increases. Students of lower ability were cited as being more likely to abuse unscheduled time. An opinionnaire given to faculty, students, and parents revealed that there was much agreement on the effectiveness of the flexible schedule. Both parents and faculty expressed "concern over the lack of scheduleback activity with guidance or administration personnel." The process known as "scheduleback" simply means that students are assigned to particular teachers and/or classrooms when they are not making satisfactory progress during independent study time. Weaknesses mentioned included the need for more open labs and more desks in the resource center (11).
A study by Zweibelson et al. revealed that: "Students in high ability tracks tended to have more negative attitudes toward school than those in lower ability groups." The attitudes of the students did not improve with ability grouping (37).

Cawelti (8) concluded that students and teachers liked flexible scheduling. Students of average or above ability adapted much more easily to independent study. Students achieved as well or better as other students in schools with traditional schedules in this Colorado study. The students also showed improvement in critical thinking.

In an evaluation of flexible scheduling after one year of use at Homewood-Flossmoor High School, Flossmoor, Illinois, it was found that the learning climate was considered better under flexible scheduling by students and teachers. Results also indicated that students were much less concerned about group control than faculty members under flexible scheduling. Both faculty and students felt the school situation was more fair. The anxieties of girls increased under the freedom of flexible scheduling while those of boys decreased (22).

Patzwald (24) in his study of innovative schools concluded that teacher values were different in an innovative school. Student motivation to learn respect and tolerance, attendance, school spirit and pride, and individualized instruction were regarded as very important in innovative schools. Teachers gave more importance (not significantly however) to unity of faculty and administration, less student loafing, more scheduled time, and professionalism than did teachers of conventional schools.
The variables of sex, age, and years of experience were also considered in Patzwald's study. Some of his findings were:

1. More males were concerned about better administrative procedures and proper dress than females; females place greater emphasis on the necessity to motivate students more effectively to learn than did the male counterparts.
2. Generally speaking, younger teachers (less than 31) appeared more concerned about facilities, faculty unity, better counseling, better vocational training offerings, and better faculty and department meetings. The older teacher (over 30) generally favored more stringent rules as they apply to enforcing school procedures and uniformity in applying school discipline. (Better counselors and better faculty meetings for younger teachers were the only statistically significant concerns).
3. The less experienced (ten years or less) demonstrated more concern about the importance of faculty unity and better and more appropriate faculty meetings. The more experienced teacher (over ten years) appeared to express greater concern about the lack of order and discipline as students gained more freedom (24).

In the innovative school studied an increase in freedom of students and a more permissive atmosphere was noted (24).

Huntington (17) in his comparison of student attitudes in selected Iowa High Schools concluded that the attitudes of students in innovative schools were no more positive than those of students in conventional schools. In regard to achievement Huntington's study showed that students scored higher on achievement tests under conventional scheduling.

Manatt and Ruebling (21) in a summary of the two previous studies (Patzwald and Huntington) stated the implications as follows:

1. The development of teacher skills, knowledge,
and attitudes required to effectively implement the theory and philosophy of an innovative program is prerequisite to successful innovation. The required teacher training programs do not appear to have been fully developed at this time.

2. Students too, must learn a new role in the learning process if the innovation is to be successfully implemented.

3. The approach to planning and implementing change in education needs to be more systematic.

4. The evaluative criteria for innovative programs needs to be more adequately defined and the rationale for the criteria understood by innovators so that they can argue for new measures of effective instruction (21).

Haugo (15) compared modular and traditional scheduling using two sophomore classes in a Minneapolis suburban high school. One class was taught under the traditional plan in 1966-67 and the other under modular scheduling in 1967-68. In the area of achievement students under the modular plan achieved significantly higher scores on ITED tests of interpreting reading materials in the social sciences, natural sciences, and literature. Students taught under the traditional schedule scored high on Correctness and Appropriateness of Expression and General Vocabulary. On a questionnaire administered to juniors and seniors who had been taught under both plans, Haugo received the following response:

Twenty-seven of the items elicited responses from the students as to whether they perceived more, about the same, or less opportunities under the modular plan to accomplish various objectives of the teaching-learning process. A chi-square method of analysis revealed that on seventeen of the items, the number of students who perceived more opportunities was significantly greater than the number who regarded the opportunities to be about the same or less (15).
Both students and teachers in this study expressed a preference for the modular plan over the traditional plan.

Lawrence (19) made a study of three groups of high schools that had experience with flexible scheduling. The schools varied in length of experience from one to six years. Most students in the study viewed flexible scheduling favorably. Small group sessions and independent study were rated much higher than large group instruction which was considered low in value. The most difficult problem perceived by students and teachers alike was the constructive use of unscheduled time. Teachers felt that they had been stimulated to improve classroom instruction by the flexible program (19).

Among the problems reported by schools on modular scheduling is that the initial cost of moving into a modular program is usually higher than the cost of a traditional program. The cost will vary depending on school facilities and previous expenditures (3).

In a survey of parent opinions on modular scheduling at General William Mitchell High School, Colorado, parents responded favorably to all parts of the program. They rated small group instruction the highest, large group next, and independent study third. Those parents whose children were college bound rated the program more highly than parents of students who were planning on working, vocational training, or armed forces. Seventy-two percent thought it should be abolished, and six percent were uncertain (14). VanDyke summarized the studies on flexible scheduling as follows:

By way of summary, these studies tend to show:
(1) Students are sold. A large majority of students who have been involved in both flexible and conventional programs prefer the flexible. And students in flexible schools most frequently state that flexibility and self-responsibility are the things they like most about their school. On the other hand, students in conventional schools most frequently criticize the regimentation-on-open-ended questions. (2) Students under independent and self-directive study plans make much greater use of resource materials and special facilities than they do under conventional programs. (3) Students in flexible programs score significantly higher than students in traditional classes on tests of critical thinking. (4) On standardized achievement tests, such as the I.T.E.D., there are no systematic differences between mean scores by students in flexible and traditional schools. (5) However, teachers rate student achievement higher for students under independent study than for students under conventional class instruction. (6) Teachers in flexible and conventional schools rate student behavior about the same. This is true also on "before" and "after" ratings by teachers who have been involved in a change-over. (7) Teachers involved in the transition from conventional to modular, vote to continue with the modular after one year or more of experience in a large majority of schools that have changed. Also, teachers in schools with both types of classes rate the flexible program higher than the conventional. (8) Teachers and students consistently rate independent study and small group instruction. (9) Teachers report that they have and use more time in preparation under a flexible program than under a conventional one. However, this is reported as one of the problem areas by teachers in flexible programs, with teachers indicating that they believe they do not use unscheduled time as constructively as they should. (10) Teachers believe that they put in longer hours and that their work load is heavier under a flexible program than under a traditional program. However, classroom hours and student loads are no greater, and often are lighter. (11) Studies on teacher morale in flexible and traditional schools show no important differences (33).

It is apparent that modular scheduling is no panacea. It cannot make good teachers out of poor teachers or diligent scholars
out of lazy students. The transition from conventional scheduling is hard work and time consuming. Even after the flexible schedule is adopted there is no guarantee of flexibility; this is up to teachers and students (3).

The studies reviewed in this section are merely a beginning in evaluating teaching—learning modes. Methods of evaluation must be refined if a clear picture of the different modes is to emerge. In many of the studies the investigation involved very few schools; thus the validity of such studies must be questionable. Another shortcoming of present studies involves those who were interviewed and questioned; in some studies not all those involved had a chance to voice their opinions. The emphasis was placed on only one segment of the group involved.

All the teaching—learning modes should be evaluated equally. It is extremely important that each is investigated thoroughly through contacts with students and teachers. The methodology of this study involves all teaching—learning modes. Students, teachers, and administrators in four of the Great Plains states were contacted in this investigation.
CHAPTER III. METHODS AND PROCEDURES

This study was developed because of the need to secure reactions of high, average, and low ability students to the four teaching-learning modes used by high schools that are on flexible modular scheduling in order to improve the implementation and program of the New Design. The study will attempt to describe and determine the influence of the four teaching-learning modes, namely, Large Group Instruction, Small Group Instruction, Independent Study, and Open Labs. High schools using flexible modular scheduling from the Great Plains Area were used in this study.

The writer first became interested in this study during an interview with John Patzwald, Senior High School Principal at Mason City, Iowa, concerning the relative effectiveness of each mode upon students of varying academic ability.

Further conversations were held with Lloyd Trump of the National Association of Secondary School Principals, concerning this study. Dr. Trump stated that to his knowledge no study had been completed in this particular area and he offered consultive help in any way on the research of this topic. In order to secure a list of the high schools in the Great Plains Area that were on flexible modular scheduling it was necessary to contact Burdette P. Hansen, Director of the Measurement Research Center at Iowa City, and Darrell Brophy of the Mid-Iowa Computer Center. These two gentlemen were very helpful in furnishing a list of schools they scheduled. Robert Brown, Principal of Burke High School in Omaha, Nebraska, was contacted and he suggested that
the North Central Association of Secondary Schools with offices in Chicago, Illinois, could provide a more accurate list of schools in the Great Plains Area on flexible modular scheduling.

John Stanavage, Executive Secretary of the North Central Association of Secondary Schools was then contacted and his office provided a complete list of all high schools in the Great Plains Area on flexible modular scheduling. On December 6, 1971, a letter was sent to all schools identified from the above sources asking them to complete an enclosed postcard to determine if that particular school offered each of the four teaching-learning modes. It was decided to use only those schools that offered all four teaching-learning modes and had been on flexible modular scheduling for at least two years. Seventy-one letters were sent out to high schools in the Great Plains Area. Sixty-three replies were received and of this number forty-seven met the criteria for the study.

It was decided to send questionnaires to three groups of people:

1. High school principals
2. High school teachers
3. High school seniors

Seniors were chosen to represent student reaction because if a school has been on modular flexible scheduling for three years then the seniors would have been exposed to the four teaching-learning modes all three years.

Twenty-six teachers and administrators studying the New Design in Extension Class, Education 590C, "Individualizing Instruction", 
developed questions about teaching-learning modes through a series of "brainstorming" sessions. In the evaluation of responses from questionnaire items it was decided to use the certainty method for measurement. The certainty method of scoring incorporates a given response framework as well as assigning of numbers to stimuli (34).

A second letter was sent on January 12, 1972, to the forty-seven qualifying schools requesting a rank order listing by cumulative grade point average (GPA) of the 1971-72 senior class along with a list of all teachers in the four major curriculum areas of math, science, English and social studies who had taught under this discipline for at least two years. The request for the list of all seniors by rank order was devised so that a random selection of ten students from the top third (high ability), ten students from the middle third (average ability), and ten students from the lower third (low ability) could be selected. It was felt that if a random selection of the students was used it would reduce bias. The four major curricula of mathematics, science, English, and social studies were selected because these four areas would in all likelihood offer all of the four teaching-learning modes.

A self-addressed postcard was included in the second letter requesting the high school principals to indicate whether or not they would be willing to furnish this information.

In the second letter the high school principals were invited to allow a personal visit to their school where the questionnaire would be explained and administered to students, teachers, and the principal.
Of the forty-seven letters sent out, thirty-four schools agreed to furnish the rank order of seniors and the list of teachers.

Those schools which had not returned the card indicating whether or not they would participate in the research were contacted by phone on January 26 and 27, 1972.

On January 28, 1972, a letter was sent to schools that had not furnished the rank order of the senior class and the teachers in the four curriculum areas requesting that they send the information no later than February 7, 1972.

On January 25, 1972, an open lab in a small senior high school in Iowa was visited to observe open lab procedure in operation.

On January 27, 1972, a conference was held with the principal of a large senior high school in Iowa to obtain his reactions to the proposed questionnaire. Some corrections and deletions were made in the questionnaire as a result of this conference.

The questionnaire was administered on February 8, 1972, to one of the thirty-four participating high schools. Students were assembled in a central location to complete the questionnaires. The questionnaires were distributed, and the instructions explained. The students completed the questionnaires in approximately twenty-five minutes without any apparent difficulty. The principal and four teachers completed their questionnaires in their free time and returned them by mail.

On February 8, 1972, a letter was sent (with the questionnaires included) to thirty-one senior high schools in the Great Plains Area.
It was requested that the schools return the questionnaires by no later than February 18, 1972, in the enclosed stamped envelope.

To validate the field survey, the questionnaire was personally administered to a senior high school in South Dakota on February 14, 1972, one in Missouri on February 16, 1972, and a Nebraska senior high school on February 23, 1972.

As of February 24, 1972, all but six of the thirty-one participating schools had returned the questionnaires. These six were contacted by telephone and asked to return the questionnaires no later than Monday, February 28, 1972.

Analysis of the Data

The data received from the participating schools were coded. The coded data were then placed on IBM cards at the Iowa State University Computer Center. After verifying the coded data, means and standard deviations were obtained for the variables. The one and five percent levels were used to denote significance. An "F" test was selected for comparing the means of the variables. A table of "F" values at the one and five percent levels verified any significant difference in the means. The analysis of variance technique is a statistical method of testing for significant differences between means of two or more groups. It may also be used to test the mean differences between more than two groups simultaneously (25).

Analysis of variance can also be used to test the relationship between one dependent variable and two or more independent variables. It can further be employed to test for relationships between the dependent
variable and various interactions of the independent variables.

The questions in Chapter One lead to the following hypotheses:

1. There is no significant difference among principals, teachers, and students in their attitudes toward Large Group Instruction (LGI).

2. There is no significant difference among principals, teachers, and students in their attitudes toward Small Group Instruction (SGI).

3. There is no significant difference among principals, teachers, and students in their attitudes toward Independent Study (IS).

4. There is no significant difference among principals, teachers, and students in their attitudes toward Open Labs (OL).

5. There is no significant difference in teacher responses to Large Group Instruction (LGI) as characterized by sex, male or female.

6. There is no significant difference in teacher responses to Small Group Instruction (SGI) as characterized by sex, male or female.

7. There is no significant difference in teacher responses to Independent Study (IS) as characterized by sex, male or female.

8. There is no significant difference in teacher responses to Open Labs (OL) as characterized by sex, male or female.

9. There is no significant difference in principal responses to Large Group Instruction (LGI) as characterized by sex, male or female.

10. There is no significant difference in principal responses to Small Group Instruction (SGI) as characterized by sex, male or female.

11. There is no significant difference in principal responses to Independent Study (IS) as characterized by sex, male or female.

12. There is no significant difference in principal responses to Open Labs (OL) as characterized by sex, male or female.
13. There is no significant difference in student responses to Large Group Instruction (LGI) when categorized on the basis of sex.

14. There is no significant difference in student responses to Small Group Instruction (SGI) when categorized on the basis of sex.

15. There is no significant difference in student responses to Independent Study (IS) when categorized on the basis of sex.

16. There is no significant difference in student responses to Open Labs (OL) when categorized on the basis of sex.

17. There is no significant difference in student responses to Large Group Instruction (LGI) when categorized on the basis of academic ability, high, average, or low.

18. There is no significant difference in student responses to Small Group Instruction (SGI) when categorized on the basis of academic ability, high, average, or low.

19. There is no significant difference in student responses to Independent Study (IS) when categorized on the basis of academic ability, high, average, or low.

20. There is no significant difference in student responses to Open Labs (OL) when categorized on the basis of academic ability, high, average, or low.

21. There is no significant difference in student responses to Large Group Instruction (LGI) when categorized on the basis of both sex and academic ability.

22. There is no significant difference in student responses to Small Group Instruction (SGI) when categorized on the basis of both sex and academic ability.

23. There is no significant difference in student responses to Independent Study (IS) when categorized on the basis of both sex and academic ability.

24. There is no significant difference in student responses to Open Labs (OL) when categorized on the basis of both sex and academic ability.
CHAPTER IV. FINDINGS

This chapter contains the findings of this study which compares attitudes of students of high, average, and low ability to the four teaching-learning modes in flexible-modular scheduled schools in the Great Plains Area. This chapter will also compare the attitudes of students of high, average, and low ability with teachers and principals in these same schools. The study will further describe attitudes based on sex of students, principals, and teachers.

The findings in this chapter will be explained mainly through the use of tables and figures of tabulated means, variances, frequency counts and percentages, plus a general resume and discussion of the findings. There will be no attempt to reach conclusions of the results in this chapter.

The schools in this study consisted of thirty-four senior high schools in the Great Plains Area of Iowa, Nebraska, South Dakota, and Missouri. Only senior students, high school teachers, and high school principals were questioned as to their attitudes regarding Large Group Instruction, Small Group Instruction, Independent Study, and Open Labs. The thirty-four schools in this study consisted of both public and private senior high schools. It included both small senior high schools (of less than thirty seniors) and larger senior high schools (over six hundred seniors).

The questionnaire, consisting of ten questions in each of the four teaching-learning modes, obtained responses from seniors, teachers,
and principals. The respondents were asked to read each statement and either agree or disagree with each question. If they had no opinion as to the question they would circle both the agree and disagree response. If they agreed or disagreed with the question then they circled a number from one to five indicating the amount of agreement or disagreement with one indicating slight agreement or disagreement. There were eleven possible answers to each question and they were coded from strongly agree (A/5) as a +5 value to strongly disagree (D/5) as a -5 value.

Table number one, concerning Open Labs, contains the mean responses to the ten questions. Inspection of Table number one indicates there were no negative means for any of the five groups indicating that on the average response for the three student groups, teachers, and principals, each group generally agreed as far as their overall mean was concerned.

Table number two, Open Labs, lists the number of respondents who agreed, disagreed, and had no opinion (A/D). The percentages are listed under the frequency count. Table number two indicates that more respondents agreed than disagreed with each question.

In Table number three, Independent Study, there were some categories of respondents who on the average disagreed with the statement. In question number three, principals slightly disagreed with the statement, "You have opportunity to complete IS in all curriculum areas." On question number nine there were three categories of respondents who disagreed with that question, the high ability students,
Table 1. Open Labs. Mean responses of students, teachers and principals.

<table>
<thead>
<tr>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>1. Teachers available for help, planning, and follow-up.</td>
</tr>
<tr>
<td>2. Resource centers available to students.</td>
</tr>
<tr>
<td>3. Open Labs at least one hour in length.</td>
</tr>
<tr>
<td>4. Enough mods weekly for Open Labs.</td>
</tr>
<tr>
<td>5. Develop rapport between students and teachers, plus motivation.</td>
</tr>
<tr>
<td>6. Develop self-reliance on the part of students.</td>
</tr>
<tr>
<td>7. Expand ability in IS, student work in areas of interest. Allow for make-up, catch-up, and speed-up.</td>
</tr>
<tr>
<td>8. Provisions for standardized lab exercises in lieu of original work.</td>
</tr>
<tr>
<td>9. Enough time allowed to complete objectives.</td>
</tr>
<tr>
<td>10. Purposes, directions, procedures, and applications understood.</td>
</tr>
</tbody>
</table>

*Response range is from -5 (strongly disagree) to +5 (strongly agree).*
Table 2. Open Labs\(^a\),\(^b\) Frequency counts and percentages.

<table>
<thead>
<tr>
<th>Var.</th>
<th>Students High</th>
<th>Students Average</th>
<th>Students Low</th>
<th>Teachers</th>
<th>Principals</th>
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<td>A/D</td>
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<td>51</td>
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<td>36</td>
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</tbody>
</table>

\(^a\)Column heads: A - agree; D - disagree; A/D - no opinion.

\(^b\)Top number-frequency; bottom number-percentage.
Table 3. Independent Study. Mean responses of students, teachers and principals.

<table>
<thead>
<tr>
<th>Explanation</th>
<th>Means&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Students</td>
</tr>
<tr>
<td>Variable</td>
<td>H</td>
</tr>
<tr>
<td>1. IS offered in all areas of interest.</td>
<td>.59</td>
</tr>
<tr>
<td>2. You have been helped to develop skill and responsibility to study independently.</td>
<td>2.28</td>
</tr>
<tr>
<td>3. You have opportunity to complete IS in all curriculum areas.</td>
<td>.57</td>
</tr>
<tr>
<td>4. IS is more valuable than traditional homework.</td>
<td>2.85</td>
</tr>
<tr>
<td>5. Students meet with supervising teachers at least once a week on IS projects.</td>
<td>3.03</td>
</tr>
<tr>
<td>6. Special facilities and quiet area provided for IS projects.</td>
<td>3.41</td>
</tr>
<tr>
<td>7. Students excused from class when felt that IS is more beneficial.</td>
<td>1.23</td>
</tr>
<tr>
<td>8. Students choose IS projects with teacher approval.</td>
<td>3.90</td>
</tr>
<tr>
<td>9. IS occupies 40% of students' school time.</td>
<td>-.41</td>
</tr>
<tr>
<td>10. IS develops skills to learn on your own and accept responsibility for your own learning.</td>
<td>2.91</td>
</tr>
</tbody>
</table>

<sup>a</sup>Response range is from -5 (strongly disagree) to +5 (strongly agree).
the teachers, and the principals. This question was, "IS occupies 40% of students' school time." In Table three of Independent Study all classifications of respondents indicated strong agreement with questions five, six, eight, and ten.

In Table number four, Independent Study, there were some instances in which a total of more people disagree with the response than agree with the response. However, in some cases the mean still came out with a small positive value because of the weighing factor of A/5 equaling a +5 and D/5 equaling a -5. Those who agreed may have agreed more strongly than those who disagreed.

Table number five presents the means for responses to Small Group Instruction. Here again there were several questions in which a negative mean response was recorded. In question number two, "Teachers dominate small groups," the group with the highest negative response was teachers. On question number six, "Small Group Instruction is too informal, there is too much 'off-the-subject' talk," all classifications of respondents on the average disagreed with this question. In question number seven, "There is too much SGI time, more is needed for IS," all classifications of respondents disagreed with this statement. In Table number five, Small Groups, questions one, three, and nine had fairly high positive mean values from all categories of respondents.

Examination of Table six bears out the findings of Table five on questions number two, six, and seven; in all categories of respondents there were more people who disagreed than agreed.
Table 4. Independent Study\(^{a,b}\) Frequency counts and percentages.

<table>
<thead>
<tr>
<th></th>
<th>Students High</th>
<th>Students Average</th>
<th>Students Low</th>
<th>Teachers</th>
<th>Principals</th>
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<tr>
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<td>A</td>
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<td>A/D</td>
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<td>11</td>
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<td>5</td>
</tr>
</tbody>
</table>

\(^{a}\)Column heads: A — agree; D — disagree; A/D — no opinion.

\(^{b}\)Top number—frequency; bottom number—percentage.
Table 5. Small Group. Mean responses of students, teachers and principals.

<table>
<thead>
<tr>
<th>Explanation</th>
<th>Students</th>
<th>Teachers</th>
<th>Principals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>H</td>
<td>&lt;</td>
<td>-1</td>
</tr>
<tr>
<td>1. You have discussed and understand SGI.</td>
<td>2.59</td>
<td>2.32</td>
<td>2.28</td>
</tr>
<tr>
<td>2. Teachers dominate Small Groups.</td>
<td>-.31</td>
<td>-.20</td>
<td>.06</td>
</tr>
<tr>
<td>3. Opportunity to share and gain for people of all abilities and interests.</td>
<td>2.64</td>
<td>2.76</td>
<td>2.76</td>
</tr>
<tr>
<td>4. SGI constitutes 20% of your school time.</td>
<td>1.48</td>
<td>1.47</td>
<td>1.46</td>
</tr>
<tr>
<td>5. Student-led discussions more productive than teacher-led discussions.</td>
<td>1.12</td>
<td>1.44</td>
<td>1.31</td>
</tr>
<tr>
<td>6. SGI too informal, too much &quot;off-the-subject&quot; talk.</td>
<td>-2.54</td>
<td>-1.92</td>
<td>-1.53</td>
</tr>
<tr>
<td>7. Too much SGI time, more needed in IS.</td>
<td>-2.35</td>
<td>-2.01</td>
<td>-1.66</td>
</tr>
<tr>
<td>8. One person often dominates SGI discussion.</td>
<td>.68</td>
<td>.52</td>
<td>.83</td>
</tr>
<tr>
<td>9. SGI periods used to explain and add to LGI material.</td>
<td>3.11</td>
<td>3.05</td>
<td>2.85</td>
</tr>
<tr>
<td>10. Students encouraged to plan SGI activities.</td>
<td>.25</td>
<td>.51</td>
<td>.89</td>
</tr>
</tbody>
</table>

*a Response range is from -5 (strongly disagree) to +5 (strongly agree).*
Table 6. Small Group^a,b Frequency counts and percentages.

<table>
<thead>
<tr>
<th>Var.</th>
<th>Students High</th>
<th>Students Average</th>
<th>Students Low</th>
<th>Teachers</th>
<th>Principals</th>
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</thead>
<tbody>
<tr>
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<td>A</td>
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</tr>
</tbody>
</table>

^aColumn heads: A — agree; D — disagree; A/D — no opinion.

^bTop number—frequency; bottom number—percentage.
In Table number seven the means are listed for questions concerning LGI. There were a few negative means on questions one and seven. On question number ten, "LGI should not exceed sixty minutes," the highest positive mean in each category for the entire study was obtained.

In table eight on Large Group Instruction are recorded the frequency counts and percentages to the ten questions in that area.

Analysis of Variance

As outlined in Chapter One, the investigation seeks answers to the following questions:

1. Is there a significant difference among principals, teachers, and students in their attitudes toward Large Group Instruction (LGI), Small Group Instruction (SGI), Independent Study (IS), and Open Labs (OL)?

2. Is there a significant difference in teacher responses to the four teaching-learning modes as characterized by sex, male or female?

3. Is there a significant difference in principal responses to the four teaching-learning modes as characterized by sex, male or female?

4. Is there a significant difference in student responses when categorized on the basis of sex?

5. Is there a significant difference in student responses when categorized on the basis of academic ability, high, average, low?
Table 7. Large Group. Mean responses of students, teachers and principals.

<table>
<thead>
<tr>
<th>Explanation</th>
<th>Means&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Students</td>
</tr>
<tr>
<td>1. Materials in LGI only those not readily presentable or obtainable from other sources.</td>
<td>-.33</td>
</tr>
<tr>
<td>2. LGI handouts given in advance to be reinforced in lecture.</td>
<td>2.28</td>
</tr>
<tr>
<td>3. Twenty-five to thirty-five minutes ample time for LGI.</td>
<td>2.72</td>
</tr>
<tr>
<td>4. Physical facilities and equipment adequate for LGI.</td>
<td>2.22</td>
</tr>
<tr>
<td>5. Questions may be asked in LGI by audience.</td>
<td>1.39</td>
</tr>
<tr>
<td>6. LGI material presented by most capable person.</td>
<td>1.07</td>
</tr>
<tr>
<td>7. LGI used for tests, dispensing materials, explaining assignments, and motivation.</td>
<td>-.22</td>
</tr>
<tr>
<td>8. Students excused from LGI if they have completed work to be discussed.</td>
<td>1.77</td>
</tr>
<tr>
<td>9. Size of LGI not important because of little audience participation.</td>
<td>.92</td>
</tr>
<tr>
<td>10. LGI should not exceed 60 minutes.</td>
<td>4.60</td>
</tr>
</tbody>
</table>

<sup>a</sup>Response range is from -5 (strongly disagree) to +5 (strongly agree).
Table 8. Large Group\textsuperscript{a,b} Frequency counts and percentages.

<table>
<thead>
<tr>
<th>Var</th>
<th>Students High A</th>
<th>Students Average A</th>
<th>Students Low A</th>
<th>Teachers A</th>
<th>Principals A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>146 163 14</td>
<td>131 162 23</td>
<td>148 139 21</td>
<td>101 55</td>
<td>6 21 12 1</td>
</tr>
<tr>
<td></td>
<td>45 51 4</td>
<td>41 52 7</td>
<td>48 45 7</td>
<td>62 34 4</td>
<td>62 35 3</td>
</tr>
<tr>
<td>2</td>
<td>257 54 12</td>
<td>246 58 12</td>
<td>237 57 14</td>
<td>106 39 17</td>
<td>26 5 3</td>
</tr>
<tr>
<td></td>
<td>80 16 4</td>
<td>78 18 4</td>
<td>77 18 5</td>
<td>65 24 11</td>
<td>76 15 9</td>
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<tr>
<td>3</td>
<td>261 56 6</td>
<td>262 50 4</td>
<td>240 59 9</td>
<td>127 31 4</td>
<td>28 6 0</td>
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<tr>
<td></td>
<td>81 17 2</td>
<td>83 16 1</td>
<td>78 19 3</td>
<td>78 19 3</td>
<td>82 18 0</td>
</tr>
<tr>
<td>4</td>
<td>254 49 20</td>
<td>217 71 28</td>
<td>220 72 16</td>
<td>116 39 7</td>
<td>31 3 0</td>
</tr>
<tr>
<td></td>
<td>79 15 6</td>
<td>69 22 9</td>
<td>71 24 5</td>
<td>72 24 4</td>
<td>91 9 0</td>
</tr>
<tr>
<td>5</td>
<td>225 94 4</td>
<td>223 87 6</td>
<td>216 76 16</td>
<td>124 29 9</td>
<td>23 9 2</td>
</tr>
<tr>
<td></td>
<td>70 29 1</td>
<td>71 27 2</td>
<td>70 25 5</td>
<td>77 17 6</td>
<td>68 26 6</td>
</tr>
<tr>
<td>6</td>
<td>203 90 30</td>
<td>219 69 28</td>
<td>205 83 20</td>
<td>94 30 38</td>
<td>22 10 2</td>
</tr>
<tr>
<td></td>
<td>63 28 9</td>
<td>69 22 9</td>
<td>67 26 7</td>
<td>58 18 24</td>
<td>65 29 6</td>
</tr>
<tr>
<td>7</td>
<td>143 174 6</td>
<td>183 124 9</td>
<td>193 102 13</td>
<td>51 95 16</td>
<td>14 19 1</td>
</tr>
<tr>
<td></td>
<td>44 54 2</td>
<td>58 49 3</td>
<td>63 33 4</td>
<td>31 59 10</td>
<td>41 56 3</td>
</tr>
<tr>
<td>8</td>
<td>220 92 11</td>
<td>211 96 9</td>
<td>195 103 10</td>
<td>95 53 14</td>
<td>21 11 2</td>
</tr>
<tr>
<td></td>
<td>68 29 3</td>
<td>67 30 3</td>
<td>63 34 3</td>
<td>59 32 9</td>
<td>62 32 6</td>
</tr>
<tr>
<td>9</td>
<td>190 121 12</td>
<td>188 119 9</td>
<td>162 130 16</td>
<td>87 66 9</td>
<td>27 7 0</td>
</tr>
<tr>
<td></td>
<td>59 37 4</td>
<td>59 48 3</td>
<td>53 42 5</td>
<td>54 40 6</td>
<td>79 21 0</td>
</tr>
<tr>
<td>10</td>
<td>314 4 5</td>
<td>303 8 5</td>
<td>291 19 8</td>
<td>157 1 4</td>
<td>34 0 0</td>
</tr>
<tr>
<td></td>
<td>97 1 2</td>
<td>96 2 2</td>
<td>94 3 3</td>
<td>97 1 2</td>
<td>100 0 0</td>
</tr>
</tbody>
</table>

\textsuperscript{a}Column heads: A - agree; D - disagree; A/D - no opinion.

\textsuperscript{b}Top number=frequency; bottom number=percentage.
6. Is there a significant difference in student responses when categorized on the basis of both sex and academic ability?

These six questions provide the basis for generating the following hypotheses:

1. There is no significant difference among principals, teachers, and students in their attitudes toward Large Group Instruction (LGI).

2. There is no significant difference among principals, teachers, and students in their attitudes toward Small Group Instruction (SGI).

3. There is no significant difference among principals, teachers, and students in their attitudes toward Independent Study (IS).

4. There is no significant difference among principals, teachers, and students in their attitudes toward Open Labs (OL).

5. There is no significant difference in teacher responses to Large Group Instruction (LGI) as characterized by sex, male or female.

6. There is no significant difference in teacher responses to Small Group Instruction (SGI) as characterized by sex, male or female.

7. There is no significant difference in teacher responses to Independent Study (IS) as characterized by sex, male or female.

8. There is no significant difference in teacher responses to Open Labs (OL) as characterized by sex, male or female.

9. There is no significant difference in principal responses to Large Group Instruction (LGI) as characterized by sex, male or female.

10. There is no significant difference in principal responses to Small Group Instruction (SGI) as characterized by sex, male or female.
11. There is no significant difference in principal responses to Independent Study (IS) as characterized by sex, male or female.

12. There is no significant difference in principal responses to Open Labs (OL) as characterized by sex, male or female.

13. There is no significant difference in student responses to Large Group Instruction (LGI) when categorized on the basis of sex.

14. There is no significant difference in student responses to Small Group Instruction (SGI) when categorized on the basis of sex.

15. There is no significant difference in student responses to Independent Study (IS) when categorized on the basis of sex.

16. There is no significant difference in student responses to Open Labs (OL) when categorized on the basis of sex.

17. There is no significant difference in student responses to Large Group Instruction (LGI) when categorized on the basis of academic ability, high, average, or low.

18. There is no significant difference in student responses to Small Group Instruction (SGI) when categorized on the basis of academic ability, high, average, or low.

19. There is no significant difference in student responses to Independent Study (IS) when categorized on the basis of academic ability, high, average, or low.

20. There is no significant difference in student responses to Open Labs (OL) when categorized on the basis of academic ability, high, average, or low.

21. There is no significant difference in student responses to Large Group Instruction (LGI) when categorized on the basis of both sex and academic ability.

22. There is no significant difference in student responses to Small Group Instruction (SGI) when categorized on the basis of both sex and academic ability.

23. There is no significant difference in student responses to Independent Study (IS) when categorized on the basis of both sex and academic ability.
There is no significant difference in student responses to Open Labs (OL) when categorized on the basis of both sex and academic ability.

**Null Hypothesis 1**

There is no significant difference among principals, teachers, and students in their attitudes toward Large Group Instruction (LGI). Table nine lists the analysis of variance on Large Group Instruction and where there was a significant difference indicated by the F value, a Scheffe test of significance was applied to locate these differences. The Scheffe test of significance was used to compare the means of principals versus students (P/S), teachers versus students (T/S), and principals versus teachers (P/T). On question number one there was a highly significant F value. The Scheffe test of significance indicates the difference was highly significant between both the principals versus students and teachers versus students. On question number two there was a highly significant F value and the Scheffe test of significance indicates that there was a highly significant difference between teachers versus students. On question number four, there was a significant F value and the Scheffe test of significance indicates there was a significant difference between principals versus students. On question number seven, there was a highly significant F value and the Scheffe test of significance indicates a significant difference between principals versus students, and a highly significant difference between teachers versus students. Therefore, hypothesis number one is rejected for: "Materials in LGI only those not readily presentable or obtainable from other sources," "LGI handouts given in advance to be
Table 9. The analysis of variance among principals, teachers, and students and their attitudes toward Large Group Instruction

<table>
<thead>
<tr>
<th>Category</th>
<th>ANOV</th>
<th>Scheffe Test - F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F Values</td>
<td>P/S</td>
</tr>
<tr>
<td>1. Materials in LGI only those not presentable or obtainable from other sources.</td>
<td>10.617** 27.816** 8.593**</td>
<td>.049</td>
</tr>
<tr>
<td>2. LGI handouts given in advance to be reinforced in lecture.</td>
<td>7.071** .058 7.006**</td>
<td>.941</td>
</tr>
<tr>
<td>3. Twenty-five to thirty-five minutes ample time for LGI.</td>
<td>.142</td>
<td></td>
</tr>
<tr>
<td>4. Physical facilities and equipment adequate for LGI.</td>
<td>3.769* 3.755* 0.080 2.775</td>
<td></td>
</tr>
<tr>
<td>5. Questions may be asked in LGI by audience.</td>
<td>2.857</td>
<td></td>
</tr>
<tr>
<td>6. LGI material presented by most capable person.</td>
<td>.133</td>
<td></td>
</tr>
<tr>
<td>7. LGI used for tests, dispensing materials, explaining assignments, and motivation.</td>
<td>16.106** 3.218* 13.562**</td>
<td>.000</td>
</tr>
<tr>
<td>8. Students excused from LGI if they have completed work to be discussed.</td>
<td>1.815</td>
<td></td>
</tr>
<tr>
<td>9. Size of LGI not important because of little audience participation.</td>
<td>2.631</td>
<td></td>
</tr>
<tr>
<td>10. LGI should not exceed 60 minutes.</td>
<td>.006</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at or beyond the 5% level.  
** Significant at or beyond the 1% level.
reinforced in lecture," "Physical facilities and equipment adequate for LGI," "LGI used for tests, dispensing materials, explaining assignments, and motivation." The values of F were not significant for the remaining six attitude variables. Thus, the null hypothesis was not rejected for "Twenty-five to thirty-five minutes ample time for LGI," "Questions may be asked in LGI by audience," "LGI material presented by most capable person," "Students excused from LGI if they have completed work to be discussed," "Size of LGI not important because of little audience participation," and "LGI should not exceed sixty minutes."

Null Hypothesis 2

There is no significant difference among principals, teachers, and students in their attitudes toward Small Group Instruction (SGI). Table ten lists the analysis of variance on Small Group Instruction and where there was a significant difference indicated by the F value a Scheffe test was applied to locate these differences. On question number one there was a highly significant F value. The Scheffe test indicates a significant difference on teachers versus students. On question number two there was a highly significant F value and the Scheffe test indicates that there was a highly significant difference between teachers versus students. In question number four there was a highly significant F value and the Scheffe test indicates a significant difference on teachers versus students. Therefore, hypothesis number two is rejected for: "Discussion and understanding of SGI," "Teachers dominate SGI," "The opportunity to share and gain for people of all abilities and interests," and "SGI constitutes twenty percent of school
Table 10. The analysis of variance among principals, teachers, and students and their attitudes toward Small Group Instruction

<table>
<thead>
<tr>
<th>Category</th>
<th>ANOV</th>
<th>Scheffe Test - F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F Values</td>
<td>P/S</td>
</tr>
<tr>
<td>1. You have discussed and understand SGI.</td>
<td>4.751**</td>
<td>1.692</td>
</tr>
<tr>
<td>2. Teachers dominate Small Groups.</td>
<td>6.553**</td>
<td>.740</td>
</tr>
<tr>
<td>3. Opportunity to share and gain for people of all abilities and interests.</td>
<td>6.525**</td>
<td>1.135</td>
</tr>
<tr>
<td>4. SGI constitutes 20% of your school time.</td>
<td>5.620**</td>
<td>2.081</td>
</tr>
<tr>
<td>5. Student-led discussions more productive than teacher-led discussions.</td>
<td>2.294</td>
<td></td>
</tr>
<tr>
<td>6. SGI too informal, too much &quot;off-the-subject&quot; talk.</td>
<td>.011</td>
<td></td>
</tr>
<tr>
<td>7. Too much SGI time, more needed in IS.</td>
<td>2.453</td>
<td></td>
</tr>
<tr>
<td>8. One person often dominates SGI discussion.</td>
<td>1.904</td>
<td></td>
</tr>
<tr>
<td>9. SGI periods used to explain and add to LGI materials.</td>
<td>1.611</td>
<td></td>
</tr>
<tr>
<td>10. Students encouraged to plan SGI activities.</td>
<td>.534</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at or beyond the 5% level.
** Significant at or beyond the 1% level.
time." The values of F were not significant for questions five through ten. Thus, the null hypothesis was not rejected for: "Student-led discussions more productive than teacher-led discussions," "SGI too informal, too much 'off-the-subject' talk," "Too much SGI time, more needed in IS," "One person often dominates SGI discussions," "SGI periods used to explain and add to LGI material," and "Students encouraged to plan SGI activities."

Null Hypothesis 2

There is no significant difference among principals, teachers, and students in their attitudes toward Independent Study (IS). Table eleven lists the analysis of variance on Independent Study and where there was a significant difference indicated by the F value, a Scheffe test was applied to locate these differences. On question number two there was a significant F value. The Scheffe test was applied, but there were no significant differences indicated on principals versus students, teachers versus students, or principals versus teachers. The reason the Scheffe test did not indicate a significant difference in responses of these three categories is that the analysis of variance F test has more power than Scheffe's test. On question number four there was a highly significant F value and the Scheffe test indicates that there was a highly significant difference between teachers versus students, and a significant difference between principals versus teachers. On question number five there was a highly significant F value and the Scheffe test indicates there was a highly significant difference between teachers versus students. On question number six
Table 11. The analysis of variance among principals, teachers, and students and their attitudes toward Independent Study.

<table>
<thead>
<tr>
<th>(Variables) Category</th>
<th>ANOV F Values</th>
<th>Scheffe Test - F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P Values</td>
<td>P/S</td>
</tr>
<tr>
<td>1. IS is offered in all areas of interest.</td>
<td>2.214</td>
<td>---</td>
</tr>
<tr>
<td>2. You have been helped to develop skill and responsibility to study independently.</td>
<td>3.002*</td>
<td>.257a</td>
</tr>
<tr>
<td>3. You have opportunity to complete IS in all curriculum areas.</td>
<td>2.268</td>
<td>---</td>
</tr>
<tr>
<td>4. IS is more valuable than traditional homework.</td>
<td>21.823**</td>
<td>.512</td>
</tr>
<tr>
<td>5. Students meet with supervising teachers at least once a week on IS projects.</td>
<td>13.861**</td>
<td>1.838</td>
</tr>
<tr>
<td>6. Special facilities and quiet area provided for IS projects.</td>
<td>5.419**</td>
<td>4.559*</td>
</tr>
<tr>
<td>7. Students excused from class when felt that IS is more beneficial.</td>
<td>3.150*</td>
<td>.432a</td>
</tr>
<tr>
<td>8. Students choose IS projects with teacher approval.</td>
<td>3.048*</td>
<td>2.057a</td>
</tr>
<tr>
<td>9. IS occupies 40% of students' school time.</td>
<td>10.095**</td>
<td>.709</td>
</tr>
<tr>
<td>10. IS develops skills to learn on your own and accept responsibility for your own learning.</td>
<td>.397</td>
<td>---</td>
</tr>
</tbody>
</table>

*Significant at or beyond the 5% level.
**Significant at or beyond the 1% level.
aScheffe Test of Significance not as powerful as analysis of variance.
there was a highly significant F value and the Scheffe test indicates there was a significant difference between principals versus students. On question number seven there was a significant F value but the Scheffe test was not powerful enough to indicate where this difference exists. On question number eight there was a significant F value but the Scheffe test was not powerful enough to indicate where the difference exists. On question number nine there was a highly significant F value and the Scheffe test indicates there was a highly significant difference between teachers versus students. Therefore, hypothesis number three is rejected: "Having been helped to develop skill and responsibility to study independently," "IS is more valuable than traditional homework," "Students meet with supervising teachers at least once a week on IS projects," "Special facilities and quiet area provided for IS projects," "Students excused from class when felt that IS is more beneficial," "Students choose IS projects with teacher approval," "IS occupies forty percent of students' school time." The values of F were not significant for the remaining three attitude variables. Thus the null hypothesis was not rejected for: "IS offered in all areas of interest," "Opportunity given to complete IS in all curriculum areas," and "IS develops skills to learn on your own and accept responsibility for your own learning.

Null Hypothesis 4

There is no significant difference among principals, teachers, and students in their attitudes toward Open Labs (OL). Table twelve contains the analysis of variance on Open Labs and where there was
Table 12. The analysis of variance among principals, teachers, and students and their attitudes toward Open Labs

<table>
<thead>
<tr>
<th>Category</th>
<th>ANOV</th>
<th>Scheffe Test - F Values</th>
<th>P/S</th>
<th>T/S</th>
<th>P/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teachers available for help, planning, and follow-up.</td>
<td>22.589** 3.985* 19.552**</td>
<td>.213</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Resource centers available to students.</td>
<td>3.754* .237 3.697* .175</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Open Labs at least one hour in length.</td>
<td>.327</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Enough mods weekly for Open Labs.</td>
<td>4.348* .202 4.210* .259</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Develop rapport between students and teachers, plus motivation.</td>
<td>21.431** 3.165* 19.063**</td>
<td>.103</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Develop self-reliance on the part of students.</td>
<td>4.724* 1.537 3.585* .411</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Expand ability in IS, student work in areas of interest. Allow for make-up, catch-up, and speed-up.</td>
<td>.183</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Provisions for standardized lab exercises in lieu of original work.</td>
<td>18.486** 2.021 17.058**</td>
<td>.678</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Enough time allowed to complete objectives.</td>
<td>5.677** 1.314 4.675** .007</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Purposes, directions, procedures and applications understood.</td>
<td>3.838* .852 3.180* .003</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at or beyond the 5% level.
**Significant at or beyond the 1% level.
and teachers, plus motivation," "Develop self-reliance on the part of students," "Provisions for standardized lab exercises in lieu of original work," "enough time allowed to complete objectives," and purposes, directions, procedures, and applications understood." The values of $F$ were not significant for the remaining two attitude variables. Thus the null hypothesis was not rejected for: "Open Labs at least one hour in length" and "Expand ability in IS, student work in areas of interest, allowing for make-up, catch-up, and speed-up."

**Null Hypothesis 5**

There is no significant difference in teacher responses to Large Group Instruction (LGI) as characterized by sex, male or female. Table thirteen lists the analysis of variance on Open Labs. On question number one there was a significant $F$ value. A look at the means for teachers on this question indicates that the male teachers average response was .55 and average female teachers response was 1.66. This difference in mean response indicates that female teachers agreed more strongly on the question, "Only materials are presented in LGI that are not presentable or obtainable from other sources." Therefore, hypothesis number five is rejected for: "Materials in LGI only those not readily presentable or obtainable from other sources." The values of $F$ were not significant for the remaining nine attitude variables. Thus the null hypothesis was not rejected for: "LGI handouts given in advance to be reinforced in lecture," "Twenty-five to thirty-five minutes ample time for LGI," "Physical facilities and equipment adequate for LGI," "Questions may be asked in LGI by audience," "LGI material
Table 13. The analysis of variance among teachers and their attitudes toward Large Group Instruction as characterized by sex, male or female.

<table>
<thead>
<tr>
<th>Category</th>
<th>F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Materials in LGI only those not readily presentable or obtainable from other sources.</td>
<td>4.836*</td>
</tr>
<tr>
<td>2. LGI handouts given in advance to be reinforced in lecture.</td>
<td>.032</td>
</tr>
<tr>
<td>3. Twenty-five to thirty-five minutes ample time for LGI.</td>
<td>3.517</td>
</tr>
<tr>
<td>4. Physical facilities and equipment adequate for LGI.</td>
<td>.148</td>
</tr>
<tr>
<td>5. Questions may be asked in LGI by audience.</td>
<td>1.406</td>
</tr>
<tr>
<td>6. LGI material presented by most capable person.</td>
<td>1.535</td>
</tr>
<tr>
<td>7. LGI used for tests, dispensing materials, explaining assignments, and motivation.</td>
<td>.504</td>
</tr>
<tr>
<td>8. Students excused from LGI if they have completed work to be discussed.</td>
<td>1.506</td>
</tr>
<tr>
<td>9. Size of LGI not important because of little audience participation.</td>
<td>.056</td>
</tr>
<tr>
<td>10. LGI should not exceed 60 minutes.</td>
<td>.256</td>
</tr>
</tbody>
</table>

*Significant at or beyond the 5% level.
presented by most capable person," "IGI used for tests, dispensing materials, explaining assignments, and motivation," "Students excused from IGI if they have completed work to be discussed," "Size of IGI not important because of little audience participation," "IGI should not exceed sixty minutes."

Null Hypothesis 6

There is no significant difference in teacher responses to Small Group Instruction (SGI) as characterized by sex, male or female. Table fourteen lists the analysis of variance on Small Group Instruction. On question number three there was a highly significant F value. The mean for male teachers was 3.04 and the mean for female teachers was 4.05. Thus female teachers more strongly agreed with the question "Opportunity to share and gain for people of all abilities and interests." On question number five there was a highly significant F value. The mean for male teachers was .96 and the mean for female teachers was 2.42. This indicates the female teachers more strongly agree with "Student-led discussions are more productive than teacher-led discussions." On question number six there was a significant F value. The mean for male teachers was -1.69 and the mean for female teachers was -2.59. This indicates that the female teachers more strongly reject that "SGI is too informal, too much 'off-the-subject' talk." Therefore, hypothesis number six is rejected for: "Opportunity to share and gain for people of all abilities and interests," "Student-led discussions more productive than teacher-led discussions," and "SGI too informal, too much 'off-the-subject' talk." The values of F were not significant
Table 14. The analysis of variance among teachers and their attitudes toward Small Group Instruction as characterized by sex, male or female.

<table>
<thead>
<tr>
<th>(Variables) Category</th>
<th>F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. You have discussed and understand SGI.</td>
<td>.167</td>
</tr>
<tr>
<td>2. Teachers dominate Small Groups.</td>
<td>2.498</td>
</tr>
<tr>
<td>3. Opportunity to share and gain for people of all abilities and interests.</td>
<td>11.411**</td>
</tr>
<tr>
<td>4. SGI constitutes 20% of your school time.</td>
<td>1.734</td>
</tr>
<tr>
<td>5. Student-led discussions more productive than teacher-led discussions.</td>
<td>10.470**</td>
</tr>
<tr>
<td>6. SGI too informal, too much &quot;off-the-subject&quot; talk.</td>
<td>5.160*</td>
</tr>
<tr>
<td>7. Too much SGI time, more needed in IS.</td>
<td>.600</td>
</tr>
<tr>
<td>8. One person often dominates SGI discussion.</td>
<td>.565</td>
</tr>
<tr>
<td>9. SGI periods used to explain and add to LGI material.</td>
<td>2.375</td>
</tr>
<tr>
<td>10. Students encouraged to plan SGI activities.</td>
<td>.507</td>
</tr>
</tbody>
</table>

*Significant at or beyond the 5% level.
**Significant at or beyond the 1% level.
for the remaining seven attitude questions. Therefore, the null hypothesis was not rejected for: "You have discussed and understand SGI," "Teachers dominate Small Groups," "SGI constitutes twenty percent of your school time," "Too much time is spent in SGI, more needed in IS," "One person often dominates Small Group discussion," "SGI periods used to explain and add to LGI material," and "Students encouraged to plan SGI activities."

**Null Hypothesis 7**

There is no significant difference in teacher responses to Independent Study (IS) as characterized by sex, male or female. Table fifteen lists the analysis of variance on Independent Study. On question number four there was a significant F value. The mean response of male teachers was 1.00 and the mean response of female teachers was 2.20. This indicates the female teachers more strongly agree on "IS is more valuable than traditional homework." On question number five there was a significant F value. The male teachers mean response was 3.69 and the female teacher mean response was 4.24. This indicates that the female teachers more strongly agreed with "Students meet with supervising teachers at least once a week on IS projects." Therefore, hypothesis number seven is rejected for: "IS is more valuable than traditional homework," "Students meet with supervising teachers at least once a week on IS projects." The values of F were not significant for the remaining eight attitude variables. Therefore, the null hypothesis was not rejected for: "IS offered in all areas of interest," "You have been helped to develop skill and responsibility to study
Table 15. The analysis of variance among teachers and their attitudes toward Independent Study as characterized by sex, male or female.

<table>
<thead>
<tr>
<th>Variables</th>
<th>F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IS offered in all areas of interest.</td>
<td>2.766</td>
</tr>
<tr>
<td>2. You have been helped to develop skill and responsibility to study independently.</td>
<td>.007</td>
</tr>
<tr>
<td>3. You have opportunity to complete IS in all curriculum areas.</td>
<td>.429</td>
</tr>
<tr>
<td>4. IS is more valuable than traditional homework.</td>
<td>5.988*</td>
</tr>
<tr>
<td>5. Students meet with supervising teachers at least once a week on IS projects.</td>
<td>4.367*</td>
</tr>
<tr>
<td>6. Special facilities and quiet area provided for IS projects.</td>
<td>.086</td>
</tr>
<tr>
<td>7. Students excused from class when felt that IS is more beneficial.</td>
<td>1.833</td>
</tr>
<tr>
<td>8. Students choose IS projects with teacher approval.</td>
<td>.998</td>
</tr>
<tr>
<td>9. IS occupies 40% of students' school time.</td>
<td>2.272</td>
</tr>
<tr>
<td>10. IS develops skills to learn on your own and accept responsibility for your own learning.</td>
<td>.253</td>
</tr>
</tbody>
</table>

*Significant at or beyond the 5% level.
independently," "You have opportunity to complete IS in all curriculum areas," "Special facilities and quiet area provided for IS projects," "Students excused from class when felt that IS is more beneficial," "Students choose IS projects with teacher approval," "IS occupies forty percent of students' school time," "IS develops skills to learn on your own and accept responsibility for your own learning."

**Null Hypothesis 8**

There is no significant difference in teacher responses to Open Labs (OL) as characterized by sex, male or female. Table sixteen lists the analysis of variance on Open Labs. There were no significant F values to the ten questions on Open Labs. Therefore, the null hypothesis was not rejected for: "Teachers available for help, planning, and follow-up," "Resource centers available to students," "Open Labs at least one hour in length," "Enough mods weekly for Open Labs," "Develop rapport between students and teachers, plus motivation," "Develop self-reliance on the part of students," "Expand ability in IS, student work in areas of interest and allow for make-up, catch-up, and speed-up," "Provisions for standardized lab exercises in lieu of original work," "Enough time allowed to complete objectives, purposes, directions, procedures, and applications understood."

**Null Hypothesis 9**

There is no significant difference in principal responses to Large Group Instruction (LGI) as characterized by sex, male or female. This hypothesis was not treated statistically with analysis of variance because there were only four female principals and thirty male
Table 16. The analysis of variance among teachers and their attitudes toward Open Labs as characterized by sex, male or female.

<table>
<thead>
<tr>
<th>Category</th>
<th>F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teachers available for help, planning, and follow-up.</td>
<td>.445</td>
</tr>
<tr>
<td>2. Resource centers available to students.</td>
<td>1.222</td>
</tr>
<tr>
<td>3. Open Labs at least one hour in length.</td>
<td>1.203</td>
</tr>
<tr>
<td>4. Enough mods weekly for Open Labs.</td>
<td>2.248</td>
</tr>
<tr>
<td>5. Develop rapport between students and teachers, plus motivation.</td>
<td>.094</td>
</tr>
<tr>
<td>6. Develop self-reliance on the part of students.</td>
<td>.192</td>
</tr>
<tr>
<td>7. Expand ability in IS, student work in areas of interest. Allow for make-up, catch-up, and speed-up.</td>
<td>.039</td>
</tr>
<tr>
<td>8. Provisions for standardized lab exercises in lieu of original work.</td>
<td>.976</td>
</tr>
<tr>
<td>9. Enough time allowed to complete objectives.</td>
<td>.401</td>
</tr>
<tr>
<td>10. Purposes, directions, procedures, and applications understood.</td>
<td>.001</td>
</tr>
</tbody>
</table>
Null Hypothesis 10

There is no significant difference in principal responses to Small Group Instruction (SGI) as characterized by sex, male or female. This hypothesis was not treated statistically with analysis of variance because there were only four female principals and thirty male principals.

Null Hypothesis 11

There is no significant difference in principal responses to Independent Study (IS) as characterized by sex, male or female. This hypothesis was not treated statistically with analysis of variance because there were only four female principals and thirty male principals.

Null Hypothesis 12

There is no significant difference in principal responses to Open Labs (OL) as characterized by sex, male or female. This hypothesis was not treated statistically with analysis of variance because there were only four female principals and thirty male principals.

Null Hypothesis 13

There is no significant difference in student responses to Large Group Instruction (LGI) when categorized on the basis of sex. Table seventeen lists the analysis of variance on Large Group Instruction. On question number eight of LGI there was a highly significant F value on the basis of sex. The mean for male students was 1.94 and the mean for female students was 1.34. This indicates that on the
Table 17a. The analysis of variance of student attitudes to Large Group Instruction on the basis of sex and academic ability.

<table>
<thead>
<tr>
<th>Category</th>
<th>F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sex</td>
</tr>
<tr>
<td>1. Materials in LGI only those not readily presentable or obtainable from other sources.</td>
<td>.171</td>
</tr>
<tr>
<td>2. LGI handouts given in advance to be reinforced in lecture.</td>
<td>2.457</td>
</tr>
<tr>
<td>3. Twenty-five to thirty-five minutes ample time for LGI.</td>
<td>.035</td>
</tr>
<tr>
<td>4. Physical facilities and equipment adequate for LGI.</td>
<td>2.620</td>
</tr>
<tr>
<td>5. Questions may be asked in LGI by audience.</td>
<td>1.937</td>
</tr>
<tr>
<td>6. LGI material presented by most capable person.</td>
<td>.780</td>
</tr>
<tr>
<td>7. LGI used for tests, dispensing materials, explaining assignments, and motivation.</td>
<td>.005</td>
</tr>
<tr>
<td>8. Students excused from LGI if they have completed work to be discussed.</td>
<td>7.585**</td>
</tr>
<tr>
<td>9. Size of LGI not important because of little audience participation.</td>
<td>1.134</td>
</tr>
<tr>
<td>10. LGI should not exceed 60 minutes.</td>
<td>.510</td>
</tr>
</tbody>
</table>

*Significant at or beyond the 5% level.
**Significant at or beyond the 1% level.
Table 17b. Large Group Instruction.

<table>
<thead>
<tr>
<th></th>
<th>Scheffe Test—F Values</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H/L</td>
<td>A/L</td>
<td>H/A</td>
</tr>
<tr>
<td>4. Physical facilities and equipment adequate for LGI.</td>
<td>2.051</td>
<td>.094</td>
<td>3.010*</td>
</tr>
<tr>
<td>7. LGI used for tests, dispensing materials, explaining assignments, and motivation.</td>
<td>15.547**</td>
<td>2.411</td>
<td>5.745**</td>
</tr>
<tr>
<td>10. LGI should not exceed 60 minutes.</td>
<td>3.750*</td>
<td>1.963</td>
<td>.283</td>
</tr>
</tbody>
</table>

*Significant at or beyond the 5% level.
**Significant at or beyond the 1% level.
average male students more strongly agree than female students on
"Students excused from IGI if they have completed work to be discussed." Therefore, hypothesis number thirteen is rejected for: "Students excused from IGI if they have completed work to be discussed." The values of \( F \) were not significant for the remaining nine attitude questions. Thus the null hypothesis was not rejected for: "Materials in IGI only those not readily presentable or obtainable from other sources," "IGI handouts given in advance to be reinforced in lecture," "Twenty-five to thirty-five minutes ample time for IGI," "Physical facilities and equipment adequate for IGI," "Questions may be asked in IGI by audience," "IGI material presented by most capable person," "IGI used for tests, dispensing materials, explaining assignments, and motivation," "Size of IGI not important because of little audience participation," and "IGI should not exceed sixty minutes."

**Null Hypothesis 14**

There is no significant difference in student responses to Small Group Instruction (SGI) when categorized on the basis of sex. Table eighteen lists the analysis of variance on SGI. On question number five there was a highly significant \( F \) value. The male students mean was 1.39 and the female students mean was 1.20. This indicates that the males more strongly agreed with "Student-led discussions are more productive than teacher-led discussions." The values of \( F \) were not significant for the remaining nine attitude questions. Thus, the null hypothesis was not rejected for: "You have discussed and understand SGI," "Teachers dominate Small Groups," "Opportunity to share and gain
Table 18a. Analysis of variance of student attitudes to Small Group Instruction on the basis of sex and academic ability.

<table>
<thead>
<tr>
<th>(Variables) Category</th>
<th>F Values</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sex</td>
<td>Group</td>
<td>(Sex)x(Group)</td>
</tr>
<tr>
<td>1. You have discussed and understand SGI.</td>
<td>2.352</td>
<td>.040</td>
<td>1.070</td>
</tr>
<tr>
<td>2. Teachers dominate Small Groups.</td>
<td>.101</td>
<td>.599</td>
<td>.120</td>
</tr>
<tr>
<td>3. Opportunity to share and gain for people of all abilities and interests.</td>
<td>.189</td>
<td>.273</td>
<td>.533</td>
</tr>
<tr>
<td>4. SGI constitutes 20% of your school time.</td>
<td>.920</td>
<td>.207</td>
<td>.362</td>
</tr>
<tr>
<td>5. Student-led discussions more productive than teacher-led discussions.</td>
<td>7.389**</td>
<td>3.180*</td>
<td>4.146*</td>
</tr>
<tr>
<td>6. SGI too informal, too much &quot;off-the-subject&quot; talk.</td>
<td>.027</td>
<td>6.932**</td>
<td>.702</td>
</tr>
<tr>
<td>7. Too much SGI time, more needed in IS.</td>
<td>.528</td>
<td>2.107</td>
<td>.074</td>
</tr>
<tr>
<td>8. One person often dominates SGI discussion.</td>
<td>.012</td>
<td>.254</td>
<td>1.491</td>
</tr>
<tr>
<td>9. SGI periods used to explain and add to LGI material.</td>
<td>3.547</td>
<td>.530</td>
<td>1.192</td>
</tr>
<tr>
<td>10. Students encouraged to plan SGI activities.</td>
<td>.404</td>
<td>2.299</td>
<td>.855</td>
</tr>
</tbody>
</table>

*Significant at or beyond the 5% level.
**Significant at or beyond the 1% level.
Table 18b. Small Group Instruction.

<table>
<thead>
<tr>
<th></th>
<th>H/L</th>
<th>A/L</th>
<th>H/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Student-led discussions more productive than teacher-led discussions.</td>
<td>.280&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.130&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.804&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>6. SGI too informal, too much &quot;off-the-subject&quot; talk.</td>
<td>9.962&lt;sup&gt;**&lt;/sup&gt;</td>
<td>1.468</td>
<td>3.802&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>Scheffe test of significance not as strong as analysis of variance.

<sup>*</sup>Significant at or beyond the 5% level.

<sup>**</sup>Significant at or beyond the 1% level.
for people of all abilities and interests," "SGI constitutes twenty percent of your school time," "SGI too informal, too much 'off-the-subject' talk," "Too much SGI time, more needed in IS," "One person often dominates SGI discussion," "SGI periods used to explain and add to LGI material," and "Students encouraged to plan SGI activities."

Null Hypothesis 15

There is no significant difference in student responses to Independent Study (IS) when categorized on the basis of sex. Table nineteen lists the analysis of variance on Independent Study. On question number six there was a significant F value. The male student mean is 2.90 and the female student mean is 3.61. This indicates that the female students on the average more strongly agreed with: "Special facilities and quiet area provided for IS projects." Therefore, hypothesis fifteen is rejected for: "Special facilities and quiet area provided for IS projects." The values of F were not significant for the remaining nine attitude questions. Thus the null hypothesis was not rejected for: "IS offered in all areas of interest," "You have been helped to develop skill and responsibility to study independently," "You have opportunity to complete IS in all curriculum areas," "IS is more valuable than traditional homework," "Students meet with supervising teachers at least once a week on IS projects," "Students excused from class when felt that IS is more beneficial," "Students choose IS projects with teacher approval," "IS occupies forty percent of students' school time," "IS develops skills to learn on your own and accept responsibility for your own learning."
Table 19a. Analysis of variance of student attitudes to Independent Study on the basis of sex and academic ability.

<table>
<thead>
<tr>
<th>(Variables) Category</th>
<th>F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sex</td>
</tr>
<tr>
<td>1. IS offered in all areas of interest.</td>
<td>.670</td>
</tr>
<tr>
<td>2. You have been helped to develop skill and responsibility to study independently.</td>
<td>.133</td>
</tr>
<tr>
<td>3. You have opportunity to complete IS in all curriculum areas.</td>
<td>.891</td>
</tr>
<tr>
<td>4. IS is more valuable than traditional homework.</td>
<td>.946</td>
</tr>
<tr>
<td>5. Students meet with supervising teachers at least once a week on IS projects.</td>
<td>1.367</td>
</tr>
<tr>
<td>6. Special facilities and quiet area provided for IS projects.</td>
<td>6.156*</td>
</tr>
<tr>
<td>7. Students excused from class when felt that IS is more beneficial.</td>
<td>.206</td>
</tr>
<tr>
<td>8. Students choose IS projects with teacher approval.</td>
<td>.477</td>
</tr>
<tr>
<td>9. IS occupies 40% of students' school time.</td>
<td>.446</td>
</tr>
<tr>
<td>10. IS develops skills to learn on your own and accept responsibility for your own learning.</td>
<td>.006</td>
</tr>
</tbody>
</table>

*Significant at or beyond the 5% level.
**Significant at or beyond the 1% level.
Table 19b. Independent Study.

<table>
<thead>
<tr>
<th></th>
<th>Scheffe Test - F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H/L</td>
</tr>
<tr>
<td>5. Students meet with supervising teachers at least once a week on IS projects.</td>
<td>2.35^a</td>
</tr>
<tr>
<td>9. IS occupies 40% of students' school time.</td>
<td>5.996**</td>
</tr>
<tr>
<td>10. IS develops skills to learn on your own and accept responsibility for your own learning.</td>
<td>.135^a</td>
</tr>
</tbody>
</table>

^aScheffe test of significance not as powerful as analysis of variance.

*Significant at or beyond the 5% level.
**Significant at or beyond the 1% level.
Null Hypothesis 16

There is no significant difference in student responses to Open Labs (OL) when categorized on the basis of sex. Table twenty lists the analysis of variance on Open Labs. There were no values of F that were significant on this test. Therefore, the null hypothesis was not rejected for: "Teachers available for help, planning, and follow-up," "Resource centers available to students," "Open Labs at least one hour in length," "Enough mods weekly for Open Labs," "Develop rapport between students and teachers, plus motivation," "Develop self-reliance on the part of students," "Expand ability in IS, student work in areas of interest, and allow for make-up, catch-up, and speed-up," "Provisions for standardized lab exercises in lieu of original work," "Enough time allowed to complete objectives," and "Purpose, directions, procedures, and applications understood."

Null Hypothesis 17

There is no significant difference in student responses to Large Group Instruction (IGI) when categorized on the basis of academic ability, high, average, or low. Table seventeen lists the analysis of variance on Large Group Instruction and where there was a significant difference indicated by the F value, a Scheffe test was applied to locate these differences. On question number four there was a significant F value and the Scheffe test indicates a significant difference between high ability versus average ability students. On question number seven there was a highly significant F value and the Scheffe test indicates a highly significant difference between both high ability
Table 20c. Analysis of variance of student attitudes to Open Labs on the basis of sex and academic ability.

<table>
<thead>
<tr>
<th>Category</th>
<th>F Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Variables)</td>
<td>Sex</td>
</tr>
<tr>
<td>1. Teachers available for help, planning, and follow-up.</td>
<td>.313</td>
</tr>
<tr>
<td>2. Resource centers available to students.</td>
<td>1.059</td>
</tr>
<tr>
<td>3. Open Labs at least one hour in length.</td>
<td>1.853</td>
</tr>
<tr>
<td>4. Enough mods weekly for Open Labs.</td>
<td>.025</td>
</tr>
<tr>
<td>5. Develop rapport between students and teachers, plus motivation.</td>
<td>.444</td>
</tr>
<tr>
<td>6. Develop self-reliance on the part of students.</td>
<td>2.592</td>
</tr>
<tr>
<td>7. Expand ability in IS, student work in areas of interest. Allow for make-up, catch-up, and speed-up.</td>
<td>.305</td>
</tr>
<tr>
<td>8. Provisions for standardized lab exercises in lieu of original work.</td>
<td>3.263</td>
</tr>
<tr>
<td>9. Enough time allowed to complete objectives.</td>
<td>2.377</td>
</tr>
<tr>
<td>10. Purposes, directions, procedures and applications understood.</td>
<td>.638</td>
</tr>
</tbody>
</table>

*Significant at or beyond the 5% level.
Table 20b. Open Labs.

<table>
<thead>
<tr>
<th></th>
<th>H/L</th>
<th>A/L</th>
<th>H/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Purposes, direc—</td>
<td>1.922$^a$</td>
<td>.001$^a$</td>
<td>1.867$^a$</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^a$Scheffe test of significance not as strong as analysis of variance.
versus low ability students and high ability versus average ability students. On question number ten there was a significant F value and the Scheffe test indicates a significant difference between high ability versus low ability students. Therefore, hypothesis number seventeen is rejected for: "Physical facilities and equipment adequate for IGI," "IGI used for tests, dispensing materials, explaining assignments, and motivation," and "IGI should not exceed sixty minutes." The values of F were not significant for the remaining seven attitude questions. Thus, the null hypothesis was not rejected for: "Materials in IGI only those not readily presentable or obtainable from other sources," "IGI handouts given in advance to be reinforced in lecture," "Twenty-five to thirty-five minutes ample time for IGI," "Questions may be asked in IGI by audience," "IGI material presented by most capable person," "Students excused from IGI if they have completed work to be discussed," "Size of IGI not important because of little audience participation."

Null Hypothesis 18

There is no significant difference in student responses to Small Group Instruction (SGI) when categorized on the basis of academic ability, high, average, or low. Table eighteen lists the analysis of variance on Small Group Instruction and where there was a significant difference indicated by the F value, a Scheffe test was applied to locate these differences. On question number five there was a significant F value. However, the Scheffe test fails to distinguish where the differences exist. This is due to the fact that the Scheffe test is not as powerful as the analysis of variance F test. On question number
six there was a highly significant $F$ value and the Scheffe test indicates a highly significant difference between high ability versus low ability students and a significant difference between high ability versus average ability students. Therefore, hypothesis number eighteen is rejected for: "Student-led discussions more productive than teacher-led discussions," and "SGI too informal, too much 'off-the-subject' talk."

The values of $F$ were not significant for the remaining eight attitude questions. Thus the null hypothesis was not rejected for: "You have discussed and understand SGI," "Teachers dominate Small Groups," "Opportunity to share and gain for people of all abilities and interests," "SGI constitutes twenty percent of your school time," "Too much SGI time, more needed in IS," "One person often dominates SGI discussion," "SGI periods used to explain and add to LGI material," and "Students encouraged to plan SGI activities."

**Null Hypothesis 12**

There is no significant difference in student responses to Independent Study (IS) when categorized on the basis of academic ability, high, average, or low. Table nineteen lists the analysis of variance on Independent Study and where there was a significant difference indicated by the $F$ value, a Scheffe test was applied to locate these differences. On question number five there was a highly significant $F$ value. The Scheffe test fails to distinguish where the differences exist between high, average, and low ability students. This is due to the fact that the analysis of variance $F$ test has more power than Scheffe's test.

On question number nine there was a highly significant $F$ value and the
Scheffe test indicates there was a highly significant difference between high ability versus low ability students. On question number ten there was a significant F value. The Scheffe test fails to distinguish where the differences exist between high, average, and low ability students. This is due to the fact that the Scheffe test is not as powerful as the analysis of variance F test. Therefore, hypothesis nineteen is rejected for: "Students meet with supervising teachers at least once a week on IS projects," "IS occupies forty percent of students' school time," "IS develops skills to learn on your own and accept responsibility for your own learning." The values of F were not significant for the remaining seven attitude questions. Thus, the null hypothesis was not rejected for: "IS is offered in all areas of interest," "You have been helped to develop skill and responsibility to study independently," "You have opportunity to complete IS in all curriculum areas," "IS is more valuable than traditional homework," "Special facilities and quiet area provided for IS projects," "Students excused from class when felt that IS is more beneficial," "Students choose IS projects with teacher approval."

Null Hypothesis 20

There is no significant difference in student responses to Open Labs (OL) when categorized on the basis of academic ability, high, average, or low. Table twenty lists the analysis of variance on Open Labs and where there was a significant difference indicated by the F value, a Scheffe test was applied to locate these differences. On question ten there was a significant F value. The Scheffe test fails
to determine where the differences exist between high, average, and low ability students. This is due to the fact that the Scheffe test has less power than the analysis of variance F test. Therefore, hypothesis number twenty is rejected for: "Purposes, directions, procedures, and applications understood." The values of $P$ were not significant for the remaining nine attitude questions. Thus, the null hypothesis was not rejected for: "Teachers available for help, planning, and follow-up," "Resource centers available to students," "Open Labs at least one hour in length," "Enough mods weekly for Open Labs," "Develop rapport between students and teachers, plus motivation," "Develop self-reliance on the part of students," "Expand ability in IS, student work in areas of interest, allow for make-up, catch-up, and speed-up," "Provisions for standardized lab exercises in lieu of original work," "Enough time allowed to complete objectives."

**Null Hypothesis 21**

There is no significant difference in student responses to Large Group Instruction (LGI) when categorized on the basis of both sex and academic ability. Table seventeen lists the analysis of variance on Large Group Instruction. On question number four there was a significant $F$ value. Figure one shows the interaction of sex and ability on: "Large Group Instruction for physical facilities and equipment adequate for LGI." To determine where the interaction may have occurred the means were graphed in Figure 1. The interaction occurred between sexes of low ability students. Hypothesis number twenty-one is rejected for: "Physical facilities and equipment adequate
Figure 1. Interaction of Large Group, sex and ability of students.

Physical facilities and equipment are adequate for LGI.
for LGI." The values of F were not significant for the remaining nine attitude questions. Thus, the null hypothesis was not rejected for: "Materials in LGI only those not readily presentable or obtainable from other sources," "LGI handouts given in advance to be reinforced in lecture," "Twenty-five to thirty-five minutes ample time for LGI," "Questions may be asked in LGI by audience," "LGI material presented by most capable person," "LGI used for tests, dispensing materials, explaining assignments, and motivation," "Students excused from LGI if they have completed work to be discussed," "Size of LGI not important because of little audience participation," and "LGI should not exceed sixty minutes."

**Null Hypothesis 22**

There is no significant difference in student responses to Small Group Instruction (SGI) when categorized on the basis of both sex and academic ability. Table eighteen lists the analysis of variance on Small Group Instruction. On question number five there was a significant F value. Figure two shows the interaction of sex and ability on Small Group Instruction. To determine where the interaction may have occurred the means were graphed in Figure two. The interaction occurred between sexes of low ability students.

Hypothesis number twenty-two is rejected for: "Student-led discussions more productive than teacher-led discussions." The values of F were not significant for the remaining nine attitude variables. Thus, the null hypothesis was not rejected for: "You have discussed and understand SGI," "Teachers dominate Small Groups," "Opportunity to share
Figure 2. Interaction of Small Group, sex and ability of students.

SGI too informal, too much off-the-subject talk.
and gain for people of all abilities and interests," "SGI constitutes twenty percent of your school time," "SGI too informal, too much 'off-the-subject' talk," "Too much SGI time, more needed in IS," "One person often dominates SGI discussion," "SGI periods used to explain and add to IS material," "Students encouraged to plan SGI activities."

**Null Hypothesis 23**

There is no significant difference in student responses to Independent Study (IS) when categorized on the basis of both sex and academic ability. Table nineteen lists the analysis of variance on Independent Study. On question number five there was a highly significant F value. Figure three shows the interaction of sex and ability on Independent Study. To determine where the interaction may have occurred the means were graphed in Figure three. The interaction occurred between sexes of low ability students. On question number nine there was a significant F value. Figure four shows the interaction of sex and ability on Independent Study. To determine where the interaction may have occurred the means were graphed in Figure four. The interaction occurred between sexes of low ability students. Hypothesis number twenty-three is rejected for: "Students meet with supervising teachers at least once a week on IS projects," and "IS occupies forty percent of students' school time. The values of F were not significant for the remaining eight attitude questions. Thus, the null hypothesis was not rejected for: "IS is offered in all areas of interest," "You have been helped to develop
Figure 3. Interaction of Independent Study, sex and ability of students on meeting with supervising teacher at least once a week.
Figure 4. Interaction of Independent Study, sex, and ability of students.

IS occupies 40% of students' school time.
skill and responsibility to study independently," "You have opportunity to complete IS in all curriculum areas," "IS is more valuable than traditional homework," "Special facilities and quiet area provided for IS projects," "Students excused from class when felt that IS is more beneficial," "Students choose IS projects with teacher approval," "IS develops skills to learn on your own and accept responsibility for your own learning."

**Null Hypothesis 24**

There is no significant difference in student responses to Open Labs (OL) when categorized on the basis of both sex and academic ability. Table twenty lists the analysis of variance on Open Labs. There were no significant F values on the ten attitude questions of Open Labs. Thus, the null hypothesis was not rejected for: "Teachers available for help, planning, and follow-up," "Resource centers available to students," "Open Labs at least one hour in length," "Enough mode weekly for Open Labs," "Develop rapport between students and teachers, plus motivation," "Develop self-reliance on the part of students," "Expand ability in IS, student work in areas of interest, and allow for make-up, catch-up, and speed-up," "Provisions for standardized lab exercises in lieu of original work," "Enough time allowed to complete objectives," and "Purposes, directions, procedures, and applications understood."

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

Summary

The problem of this study was to determine and describe the impact (reactions) of the four teaching-learning modes of New Design schools (modular flexible scheduled) upon students of high, average, and low ability in both public and private high schools in the Great Plains Area. The four teaching-learning modes under investigation in this study were Large Group Instruction, Small Group Instruction, Independent Study, and Open Labs. The purpose of this investigation was to discover ways to improve the implementation and program of the New Design.

Contacts were made with John Patzwald, senior high school principal at Mason City, Iowa, Lloyd Trump of the National Association of Secondary School Principals, Burdette P. Hansen, Director of the Measurement Research Center at Iowa City, Iowa, Darrell Brophy of the Mid-Iowa Computer Center, and John Stanavage, Executive Secretary of the North Central Association of Secondary Schools. From these resource people a list was compiled of high schools in the Great Plains Area using flexible modular scheduling. Letters were sent to seventy-one schools and sixty-three replies were received. Out of the sixty-three replies, forty-seven schools met the criteria; thirty-four schools
agreed to furnish the necessary information and complete the question-
naire. The questionnaire was administered to the high school principal,
five randomly selected teachers, and thirty randomly selected students,
ten from each of the three ability levels of high, average, and low.

Key Findings

Positive means for all categories of respondents were recorded
on thirty-three of the forty item questionnaire. Each of the ten
responses relating to the four modes were intended to be positive
statements of desirable practices recommended by the literature.

There were marked differences in responses of male and female
principals to many of the items. For instance, on question number
seven of Large Group Instruction (Large Group Instruction is used only
for tests, dispensing materials, explaining assignments and motivation.)
there was a mean difference of 2.9 with the female principals more
strongly disagreeing than the male principals, i.e., female principals
think we are using LGI for items other than these. The mean for the
principals was not treated statistically and the difference in the mean
responses to the forty questions may not be significant because of the
difference in numbers. There were thirty male principals and only four
female principals in the study.

There were 947 student respondents in this study: 434 were males
and 513 were females. When categorized by high, average, and low
ability there were 107 high males, 216 high females, 141 average
males, 175 average females, 186 low males and 122 low females. As might
be expected, there were more females than males in both the high and
average ability groups and more males than females in the low ability group.

The attitudes toward New Design seem to depend on whether it is viewed by principals, teachers, or students. Principals tend to be more positive toward the New Design probably because they were the initiators in their school. Teachers tend to be less positive toward the New Design. Students tend to be even less positive than teachers about the New Design. This may be the result of students not being clearly informed as to the value and objectives of the four teaching-learning modes. The rationale of the four teaching-learning modes should be more thoroughly explained to students.

On the analysis of variance among principals, teachers, and students, regarding their attitudes toward the four teaching-learning modes, there were significant differences in 23 of the 40 questions. In Large Group Instruction there were four questions that had significant differences. In Small Group Instruction there were four questions that had significant differences. In Independent Study there were seven questions that had significant differences and in Open Labs there were eight questions that had significant differences.

In the analysis of variance among teachers and their attitudes toward the four teaching-learning modes as characterized by sex, male and female, there were six questions that had significant differences. In Large Group Instruction there was one question with a significant difference. In Small Group Instruction there were three questions that had significant differences. In Independent Study there were
two questions that had significant differences. In Open Labs there were no questions that were significantly different.

In the analysis of variance of student attitudes to the four teaching-learning modes on the basis of sex and academic ability, there were several questions that had significant differences. In Large Group Instruction there was one question on sex that had a significant difference. There were two questions that were significantly different on academic ability. There was one question that was significantly different on the interaction of sex and ability. In Small Group Instruction there was one question that had a significant difference on sex, there were two questions that had significant differences on academic ability, and there was one question that had significant differences on the interaction of sex by ability. In Independent Study there was one question that was significantly different on sex, there were three questions that were significantly different on academic ability, and there were two questions that were significantly different on the interaction of sex by ability. In Open Labs there was one question that was significantly different on academic ability.

Conclusions

From Chapter One, this investigation seeks answers to the following questions:

1. Is there a significant difference among principals, teachers, and students in their attitudes toward Large Group Instruction (LGI), Small Group Instruction (SGI), Independent Study (IS), and Open Labs (OL)?

2. Is there a significant difference in teacher responses to the four teaching-learning modes as characterized by sex, male or female?
3. Is there a significant difference in principal responses to the four teaching-learning modes as characterized by sex, male or female?

4. Is there a significant difference in student responses when categorized on the basis of sex?

5. Is there a significant difference in student responses when categorized on the basis of academic ability, high, average, low?

6. Is there a significant difference in student responses when categorized on the basis of both sex and academic ability?

Twenty-four null hypotheses were developed for this study. Null hypotheses nine, ten, eleven, and twelve were not tested because of the small n (four) in the category of female principals. The twenty hypotheses that were tested and their results are listed below.

Null Hypothesis 1

There is no significant difference among principals, teachers, and students in their attitudes toward Large Group Instruction (LGI).

Results: Questions
1. Rejected
2. Rejected
3. Not Rejected
4. Rejected
5. Not Rejected
6. Not Rejected
7. Rejected
8. Not Rejected
9. Not Rejected
10. Not Rejected

On question 1 principals and teachers feel that only necessary materials are presented in LGI but students feel that additional items are presented during LGI that could be presented elsewhere. On question 2 students feel that handouts should be presented and completed in advance of LGI, teachers are not so sure that this is a good practice.
On question 4, principals feel that in their school physical facilities and equipment are adequate for LGI but students don't agree with the principals. On question 7 (LGI is used only for tests, dispensing materials, explaining assignments, and motivation.), principals, teachers, and high ability students do not strongly agree that this purpose is being served in LGI while students of average and low ability feel that these purposes are being accomplished.

Null Hypothesis 2

There is no significant difference among principals, teachers, and students in their attitudes toward Small Group Instruction (SGI).

Results: Questions
1. Rejected
2. Rejected
3. Rejected
4. Rejected
5. Not Rejected
6. Not Rejected
7. Not Rejected
8. Not Rejected
9. Not Rejected
10. Not Rejected

On question one, all areas of respondents tended to agree that SGI has been discussed and is thoroughly understood. However, students indicate some lack of understanding on what constitutes SGI. On question 2 teachers tended to disagree with the idea that they dominate small groups but students aren't quite as sure. On question 3 teachers feel that all students have a chance to share and gain in SGI, but students aren't quite so sure. On question 4, principals and teachers tend to agree that twenty percent of the school time is allotted for SGI but students tend to disagree.
Null Hypothesis 2

There is no significant difference among principals, teachers, and students in their attitudes toward Independent Study.

Results: Questions
1. Not Rejected
2. Rejected
3. Not Rejected
4. Rejected
5. Rejected
6. Rejected
7. Rejected
8. Rejected
9. Rejected
10. Not Rejected

On question 2 teachers are less sure that students have been taught how to study independently. On question 4 principals and students feel that Independent Study is more valuable than homework but teachers are not quite so sure. On question 5 principals and teachers feel that students should (in most situations) meet with supervising teachers at least once a week to confer on IS projects. It may be that students are not as sure that this practice is being followed. On question 6 students feel the need for special facilities and a quiet area for IS study, but principals think less of this idea. On question 7 teachers do not agree that students should be excused from class for IS. On question 8 both teachers and students feel that students should choose their own IS projects. Principals agree less on this concept. On question 9 principals, teachers and students tend to disagree with this question but teachers most strongly indicate that less than forty percent of the school time is allowed for IS.
Null Hypothesis 4

There is no significant difference among principals, teachers, and students in their attitudes toward Open Labs (OL).

Results: Questions
1. Rejected
2. Rejected
3. Not Rejected
4. Rejected
5. Rejected
6. Rejected
7. Not Rejected
8. Rejected
9. Rejected
10. Rejected

On question 1 teachers feel that they are available during Open Labs but students feel that they are not as available as they should be. On question 2 teachers feel that resource centers are available to students, but students indicate they aren't as available as they should be. On question 4 teachers feel that there are not enough mods allowed each week for Open Labs. On question 5 students do not feel that Open Labs provide for motivation and the development of rapport with teachers. On question 6 students are not so sure that Open Labs develop self-reliance. On question 8 students do not agree, but teachers do agree that there are provisions for students to do standardized laboratory exercises when they are unable to produce original work. On question 9 students do not feel there is enough time allowed to complete objectives during OL mods. On question 10 students do not agree with principals and teachers that in OL the purposes, directions, procedures and applications are understood.
Null Hypothesis 5

There is no significant difference in teacher responses to Large Group Instruction (LGI) as characterized by sex, male or female.

Results: Questions
1. Rejected
2. Not Rejected
3. Not Rejected
4. Not Rejected
5. Not Rejected
6. Not Rejected
7. Not Rejected
8. Not Rejected
9. Not Rejected
10. Not Rejected

On question 1 female teachers tend to agree that only materials not readily presentable or obtainable from other sources are presented in LGI while male teachers responses indicate presentation of at least some materials that could be obtained outside of LGI.

Null Hypothesis 6

There is no significant difference in teacher responses to Small Group Instruction (SGI) as characterized by sex, male or female.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Rejected
4. Not Rejected
5. Rejected
6. Rejected
7. Not Rejected
8. Not Rejected
9. Not Rejected
10. Not Rejected

On question 3 female teachers apparently allow for more sharing of ideas for students of all abilities and interests than do male
teachers. On question 5 female teachers feel that student-led discussions are more productive than teacher-led discussions. On question 6 male teachers indicate more strongly than female teachers that there is too much "off-the-subject" talk.

Null Hypothesis 7

There is no significant difference in teacher responses to
Independent Study (IS) as characterized by sex, male or female.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Rejected
5. Rejected
6. Not Rejected
7. Not Rejected
8. Not Rejected
9. Not Rejected
10. Not Rejected

On question 4 female teachers feel that IS is more valuable than traditional homework. On question 5 female teachers apparently meet more often with students to confer about their IS projects.

Null Hypothesis 8

There is no significant difference in teacher responses to
Open Labs (OL) as characterized by sex, male or female.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Not Rejected
5. Not Rejected
6. Not Rejected
7. Not Rejected
8. Not Rejected
9. Not Rejected
10. Not Rejected
There were no significant differences between male and female teachers on their responses to questions on Open Labs. This might indicate that teachers need more information about the purposes and objectives of Open Labs or it may simply indicate that this is a very effectively provided mode in most schools.

**Null Hypothesis 13**

There is no significant difference in student responses to Large Group Instruction (LGI) when categorized on the basis of sex.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Not Rejected
5. Not Rejected
6. Not Rejected
7. Not Rejected
8. Rejected
9. Not Rejected
10. Not Rejected

On question 8 male students tend to agree more with the idea of being excused from LGI if work is completed. Generally speaking, male and female students have the same attitudes toward Large Group Instruction.

**Null Hypothesis 14**

There is no significant difference in student responses to Small Group Instruction (SGI) when categorized on the basis of sex.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Not Rejected
5. Rejected
6. Not Rejected
7. Not Rejected
8. Not Rejected
9. Not Rejected
10. Not Rejected

On question 5 male students feel that student-led discussions are more productive than teacher-led discussions. Generally speaking, male and female students have the same attitudes toward Small Group Instruction.

**Null Hypothesis 15**

There is no significant difference in student responses in Independent Study (IS) when categorized on the basis of sex.

**Results: Questions**
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Not Rejected
5. Not Rejected
6. Rejected
7. Not Rejected
8. Not Rejected
9. Not Rejected
10. Not Rejected

On question 6 female students feel that special physical facilities are needed in order to implement an IS program and that it is important for students to have a quiet area where they can pursue their IS projects.

**Null Hypothesis 16**

There is no significant difference in student responses to Open Labs (OL) when categorized on the basis of sex.

**Results: Questions**
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Not Rejected
5. Not Rejected
There were no significant differences between attitudes when classified by sex of students or sex of teachers on questions of Open Labs. This might indicate that there are questions unanswered concerning the values and objectives of Open Labs.

Null Hypothesis 17

There is no significant difference in student responses to Large Group Instruction (LGI) when categorized on the basis of academic ability, high, average, or low.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Rejected
5. Not Rejected
6. Not Rejected
7. Rejected
8. Not Rejected
9. Not Rejected
10. Rejected

On question 4 high and low ability students agree that physical facilities and equipment are conducive or adequate for LGI. On question 7 the high ability students do not feel that LGI is used only for tests, dispensing materials, explaining assignments, and motivation. On question 10 low ability students were less sure that LGI periods should not exceed 60 minutes.

Null Hypothesis 18

There is no significant difference in student responses to
Small Group Instruction (SGI) when categorized on the basis of academic ability, high, average, or low.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Not Rejected
5. Rejected
6. Rejected
7. Not Rejected
8. Not Rejected
9. Not Rejected
10. Not Rejected

On question 5 students of low ability were less sure that in SGI student-led discussions are more productive than teacher-led discussions. On question 6 high ability students most strongly disagree with the statement that SGI is too informal, there is too much "off-the-subject" talk.

Null Hypothesis 19

There is no significant difference in student responses to Independent Study (IS) when categorized on the basis of academic ability, high, average, or low.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Not Rejected
5. Rejected
6. Not Rejected
7. Not Rejected
8. Not Rejected
9. Rejected
10. Rejected

On question 5 students of high ability more strongly agree with the attitude that students should (in most situations) meet with
supervising teachers at least once a week to confer about their IS projects. On question 9 high ability students more strongly disagree that IS occupies at least forty percent of a student's time in their school. On question 10 average students more strongly agreed with the attitude that in their school one of the major goals of IS is to develop in all students the skills to learn on your own, and also the willingness to accept the major responsibilities for their own learning.

**Null Hypothesis 20**

There is no significant difference in student responses to Open Labs (OL) when categorized on the basis of academic ability, high, average, and low.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Not Rejected
5. Not Rejected
6. Not Rejected
7. Not Rejected
8. Not Rejected
9. Not Rejected
10. Rejected

On question 10 students of high ability had less agreement with the attitude that in Open Labs the purposes are easily understood, the directions are clean-cut, the procedures are simple and direct, the materials are familiar to pupils, and the applications of the findings are obvious.

**Null Hypothesis 21**

There is no significant difference in student responses to Large Group Instruction (LGI) when categorized on the basis of both sex
and academic ability.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Rejected
5. Not Rejected
6. Not Rejected
7. Not Rejected
8. Not Rejected
9. Not Rejected
10. Not Rejected

On question 4 there was a significant interaction between low ability males and females. The low ability males indicated much stronger agreement that physical facilities and equipment are conducive or adequate for LGI.

Null Hypothesis 22

There is no significant difference in student responses to Small Group Instruction (SGI) when categorized on the basis of both sex and academic ability.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Not Rejected
5. Rejected
6. Not Rejected
7. Not Rejected
8. Not Rejected
9. Not Rejected
10. Not Rejected

On question 5 there was a significant interaction between low ability males and females. The low ability males indicated much stronger agreement that in SGI student-led discussions are more productive than teacher-led discussions.
Null Hypothesis 23

There is no significant difference in student responses to Independent Study (IS) when categorized on the basis of both sex and academic ability.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Not Rejected
5. Rejected
6. Not Rejected
7. Not Rejected
8. Not Rejected
9. Rejected
10. Not Rejected

On question 5 there was a significant interaction between low ability males and females. The low ability males indicated much stronger agreement that students should (in most situations) meet with supervising teachers at least once a week to confer about their Independent Study projects. On question 9 there was a significant interaction between low ability males and females. The low ability males indicated much stronger agreement that IS occupies at least forty percent of a student's time in your school.

Null Hypothesis 24

There is no significant difference in student responses to Open Labs (OL) when categorized on the basis of both sex and academic ability.

Results: Questions
1. Not Rejected
2. Not Rejected
3. Not Rejected
4. Not Rejected
There were no significant interactions between sex and ability of students on the questions of Open Labs. Either students completely agree as to the functions of Open Labs or they all fail to completely understand the purposes, value, and objectives.

The questionnaire was designed so that we were looking at the "best practice" or the "pure Trump" plan. It appears that principals and teachers think they are accomplishing the goals and objectives of New Design Schools. However, students are much less sure and this is especially true among students of high ability.

Discussion

One might ask the question, "What function(s) are perceived to be obtained from each of these four teaching-learning modes?" Basically, the function of each of the teaching-learning modes is as follows:

Large Group Instruction (LGI) in the New Design Schools is that which, because it involves a large number of students, places primary emphasis on presenting materials with a minimum of interaction. Small Group Instruction (SGI) in New Design Schools has as its primary emphasis a face-to-face contact in group interaction. Instruction in which the student engages in activities independent of other students and usually independent of teacher direction is Independent Study (IS). Open Labs (OL) includes those physical facilities for which special equipment and tools are needed to enable students to work independently
and in small groups and to practice skills, to experiment, and to apply ideas suggested in Large Group Instruction. Open Labs also function most appropriately when teachers are available for independent help. Items on the questionnaire were designed to be positive in nature, i.e., the items represent the research in this area which indicates that things should go this way in a successful New Design school.

The results of this study showed that in the area of Open Labs all categories of respondents agreed with the statements, probably because of a general lack of understanding of the OL technique. In the area of Independent Study principals disagreed with "In your school you (students) have been offered the opportunity and allowed to complete IS work in all curriculum areas." On "Independent Study occupies at least forty percent of a student's time in your school," most high ability students, teachers, and principals disagreed. In the area of Small Group Instruction high ability students, low ability students, teachers, and principals tend to disagree with "Teachers dominate the Small Groups rather than being accepted as part of the group." Low ability students had a slight positive mean of .06. All categories of respondents disagreed with "Small Group Instruction is too informal, there is too much 'off-the-subject' talk," and "Too much time is spent in SGI that could be put to better use in Independent Study." In Large Group Instruction principals and teachers tended to agree with "Teachers present only materials in LGI that are not readily presentable or obtainable from any other source.," but high and average ability students tended to disagree and low ability students had a mean of .08
which indicates they were fairly evenly divided between agree and
disagree on their response. Principals, teachers, and high ability
students disagree with "LGI is used only for tests, dispensing
materials, explaining assignments, and motivation," but students of
average and low ability tended to agree with it. Trump, Allen and
other architects of the New Design insist that these are the only uses
for LGI!

Another question of concern is "Which modes do principals and
teachers perceive to be most successful with students of high, average,
and low ability?" The findings indicate that both Large and Small Group
Instruction were deemed satisfactory in these New Design Schools.
In schools where Independent Study and Open Labs had been thoroughly
explained, students appeared to receive great benefits.

"Which modes are perceived to be less effective by principals,
teachers, and students?" It would appear from the findings that in many
of the schools, Open Labs are not at least one hour in length, that
Independent Study is not offered in all areas of interest, that
Independent Study is less than forty percent of a student's school time.
Large Group Instruction is used for purposes other than those generally
considered by authorities to be most desirable. In the four schools
where the questionnaire was personally administered by the researcher
it was observed that many students were not quite sure what consti­
tuted an Open Lab. Some thought it was synonymous with Independent
Study. Many students apparently did not have adequate time for
Independent Study and were not advised as to its function and purpose.
Independent Study deserves a more thorough explanation so that it does not become associated with "free" time.

Another question might involve the relative emphasis given to each mode by teachers. In the schools surveyed teachers tended to agree with the importance of all four modes. It is doubtful if all teachers are spending as much as forty percent of their time on Independent Study and Open Lab projects. Some authorities have indicated that the allotment of time should be twenty percent LGI, twenty percent SGI, and sixty percent IS and OL.

Another question one might ask is, "What is the value of each mode to students?" Students of low ability seem to be more secure in the Large Group and Small Group modes. Students of high and average ability like Independent Study because it affords the opportunity to pursue areas of interest. Students of all abilities seem to enjoy Open Labs where teacher counsel and advice are available.

Finally it may be asked, "How does the building principal perceive the relative success of each mode for students of varying ability?" Principals tended to agree that students function most successfully in areas of their interest. Each of the modes is successful when confined to student interest areas. For the most part principals held a more positive view of all questions on all modes. Not surprisingly, principals seem to be very sold on the kind of school their flexible modular approach had produced. It is interesting to note that teachers were slightly more critical than principals (and men more than women) while students were the most critical of their school's
implementation of the four modes. "What about modes that are not effective?" Assuming that the purpose of each mode is thoroughly understood, then those that are least effective should probably be deemphasized or eliminated.

Limitations

As in all research, certain limitations must be recognized before the results of this study can be utilized. They are as follows:

1. This study consisted of a sample and not the whole population.

2. A questionnaire was used instead of in-depth interviews.

3. Only schools in the Great Plains Area (Iowa, Missouri, Nebraska, South Dakota) were used in this study.

4. Only schools were used that had been on modular flexible scheduling for two or more years.

5. The student responses consisted of a random sample of only thirty senior students in each school.

6. In each school only five teachers (randomly selected) represented the four disciplines of math, science, social studies, and English. Teachers of all other curriculum areas were omitted.

7. Because of the general approach used in the wording of the questionnaires some respondents may have reacted to "idealized" perception of the teaching modes rather than to actual practice in their schools.

8. It is assumed that teachers answered the questionnaire in a personal way because they only know what is going on in their school and not what is going on in other schools or even in other classrooms.

9. A final limitation was that this study consisted of only thirty-four public and private schools out of a possible forty-seven that qualified.
Recommendations

It is recommended that principals and teachers continue to emphasize the relative importance of each of the four teaching-learning modes. Students should be taught how to effectively use their time on Independent Study projects. More follow-up, instruction, and guidance will have to be given to students who have trouble attaining the objectives of Independent Study and Open Labs. Where necessary, rigorous, close supervision must be initiated; even to the point of "scheduling-back" to supervised study areas the non-motivated, the goof-off or the immature student. According to the findings students feel that too many extraneous matters are presented in Large Group Instruction. Also students do not feel that physical facilities and equipment are adequate for LGI.

Apparently students do not thoroughly understand SGI. Also students are fairly evenly divided on their opinion as to whether teachers dominate Small Group Instruction. In many situations SGI did not constitute the essential twenty percent of school time.

Teachers need to be made more aware of the value and dynamics of Independent Study. Most students do feel they have adequate contact and supervision with teachers on Independent Study projects. Principals should become aware of the felt needs of both teachers and students in regard to the availability of special facilities and quiet areas for IS projects. Both teachers and students felt they were most needed, but principals indicated a less positive attitude on this question. It is recommended that consideration be given for excusing students
from class when Independent Study is more beneficial. Principals and teachers should be encouraged to allow more time for Independent Study.

Teachers should try to be more available for help, planning, and follow-up during Open Labs. Of course, a reasonable balance must be attained between time for teachers to have a break(s) in the daily grind and the need for availability to pupils as a resource for IS. Many teachers, at first enthusiastic for the New Design approach, have "burnt out" after a year or two of total availability every hour of the day to scores of kids! More rapport should be developed between students and teachers in Open Labs. Students generally agree that Open Labs develop self-reliance. However, it is recommended that this be given more emphasis. For those students who are unable to produce original work it is recommended that standardized exercises be offered in Open Labs. It is also recommended that more time be allowed to complete objectives.

Because female teachers appeared more convinced that the various New Design modes are effective, administrators should maximize the leadership capability of these teachers and provide extra inservice education for "unconcerned" males. Additionally, low ability female students are generally critical of LGI, SGI, IS; changes in these approaches should be developed to provide for these girls.

The pros and cons of modular flexible scheduling have been the subject of much debate. Past studies have indicated that innovative schools of the New Design have produced some positive results. In a future study of attitudes toward the four teaching-learning modes one
might include a larger sample. This might involve a national study of modular flexible scheduled schools. It might be beneficial to include students from all levels of junior and senior high schools as well as teachers of all curriculum areas. Attitudes of parents and former students, now in college or on the job, might be sought.

More thorough understanding of Open Labs and Independent Study might be obtained by including the areas of home economics, agriculture, industrial arts, auto mechanics, music, speech, physical education, trades and industry, and office occupations. Additional valuable information might include the study of work-study programs for the educable mentally retarded. Many of these schools in this study have only been on modular flexible scheduling for less than five years. A follow-up study of these schools five years from now might reveal some definite changes in attitudes on the part of students, teachers, and principals toward each of the four teaching-learning modes. A more refined survey technique which would ask, "What is your practice in the mode (LGI, SCI, OL, IS) now?" "What should your practice be according to instructional theory?" "What would you like to do?" might provide a more accurate assessment of attitudes.
BIBLIOGRAPHY


ACKNOWLEDGMENTS

The writer wishes to extend his deep thanks and appreciation to Dr. Richard P. Manatt for his encouragement, counsel, constructive criticism and patience throughout the research on this study.

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

Sincerest thanks are extended to Dr. Ray Bryan, Dr. William Murray, Dr. Robert Thomas, Dr. Anton Netusil, and Dr. Richard P. Manatt for offering guidance and assistance while serving on my committee.

Sincerest appreciation is also expressed to Mrs. Lois Grove for many hours of work while typing this dissertation.

A final word of thanks to my wife, Bonnie, and our three children, Michael, Rachael, and Heidi for their encouragement, patience, and understanding during the course of this investigation.
APPENDIX A. SELECTED SCHOOLS WITH FLEXIBLE-MODULAR SCHEDULING IN THE GREAT PLAINS AREA
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<th>IOWA</th>
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MISSOURI

Loretto In Kansas City High School
Kansas City, Missouri

Incarnate Word Academy
St. Louis, Missouri

Rosati-Kain High School
St. Louis, Missouri

SOUTH DAKOTA

Huron High School
Huron, South Dakota

Sisseton High School
Sisseton, South Dakota

Vermillion High School
Vermillion, South Dakota
APPENDIX B. CORRESPONDENCE
December 6, 1971

Dear Administrator:

The Educational Administration Division of the Iowa State University College of Education is conducting research to improve the teaching-learning modes of Large Group Instruction, Small Group Instruction, Independent Study and Open Labs. Our first step is to determine the prevalence of these four teaching-learning modes. Would you take a moment and return the enclosed card. Please do it today.

Very truly yours,

Richard P. Manatt
Associate Professor
Chairman, Educational Administration

M. Russell Mahaffey
Researcher

encl.
In an earlier letter to you on December 6, 1971, we told you that the Educational Administration Division of the Iowa State University College of Education was conducting research to improve the teaching-learning modes of Large Group Instruction, Small Group Instruction, Independent Study, and Open Labs. Our letter of December 6, 1971, went to seventy-one senior high schools in the Great Plains Area (Iowa, Missouri, Nebraska, and South Dakota). We received replies from sixty-three of those schools (88.7%). Of the sixty-three schools replying, forty-seven (74.6%) offer all four teaching-learning modes and have been on this new discipline for a minimum of two years.

Our second step in this research project needs the support of all of the forty-seven schools. We would like to have your school included in this research. If you agree to aid in this research the following information will be needed.

1. A rank order according to grade point average of your entire senior class (1971-72). (However, I do not need the G.P.A.)

2. A complete list of all faculty members in the four disciplines of math, science, social studies, and English, who have worked with modular-flexible scheduling at least two years, include counting this year as one year.

The reason we need your entire list of seniors according to G.P.A. is that we are going to randomly select thirty students, ten from the top quarter, ten from the middle two quarters, and ten from the lower quarter. We would then like to give a student questionnaire of forty easy-to-answer questions to these thirty students. Students should be able to answer the forty questions in approximately thirty to forty-five minutes.

For item number two, we have selected only those teachers from the four major curriculum areas because it is felt that they will have had experience with all four teaching-learning modes.
We would like to receive invitations from at least one high school in each state to personally visit your school and administer this questionnaire to the thirty students, teachers and building principals.

If you agree to help us with this research project, results of our findings will be sent to each participating school.

It is very imperative that we receive the rank order of senior students and the list of all teachers with two or more years of experience in the four curriculum areas just as soon as humanly possible and hopefully no later than January 26, 1972. Enclosed is a self-addressed post card for your reply. Additional postage will be returned to your school for the cost of sending the list of students and teachers.

Very truly yours,

Richard P. Manatt
Associate Professor
Chairman, Educational Administration

M. Russell Mahaffey
Researcher

RPM: 1g

encl.

P.S. Please return request number 1 (rank order of senior class), and request number 2 (list of faculty members in the four disciplines) to:

M. Russell Mahaffey
P.O. Box 186
Grand Junction, Iowa 50107

Postage for these materials will be sent to you by return mail.
Our school will participate in this research project with the specific purpose of improving instruction in modular-flexibly scheduled schools.

YES ______

NO ______

_____________________________
High School Principal

Please return this card today.
Grand Junction, Iowa
January 28, 1972

Dear Administrator:

As of this date I have not received your rank order list of your senior class by GPA. Remember, it is not necessary for you to include the GPA but I do need the students listed in order from highest to lowest. I also need the list of your teachers in the four curriculum areas of math, science, English, and social studies who have taught on this new discipline for at least two years. If you do not have the seven semesters' rank order, would you please send me the rank order as of the end of six semesters (end of Junior year). It is most important that I receive this information no later than February 7th.

Schoolfully yours,

M. Russell Mahaffey

M. Russell Mahaffey
Box 186
Grand Junction, Iowa 50107

MRM:lg
Dear Administrator:

Within this envelope you will find thirty student questionnaires in three different colors (ten each), five teacher questionnaires in a fourth color, and one principal's questionnaire in a fifth color. The principal's questionnaire is for you to fill out; the five questionnaires for teachers should be administered to the five people listed; the thirty student questionnaires should be given to the thirty students listed or an alternate in case one or more of the students is absent. I personally administered this test today to a senior high school here in Iowa and we found that it could be completed in approximately twenty minutes. I would appreciate it greatly if you could possibly give this to the listed seniors no later than February 18th and return it to me in the enclosed self-addressed and stamped envelope. Once again I want to thank you for your outstanding cooperation on this research project. Each school will receive feedback on the results of our findings and hopefully this will help to improve instruction.

With kindest personal regards, I remain

Schoolfully yours,

M. Russell Mahaffey
Box 186
Grand Junction, Iowa 50107

MRM:lg

P.S. It is most important that you administer this test and have it in the mail back to me by February 18th, 1972.
APPENDIX C. QUESTIONNAIRE TO PRINCIPALS, TEACHERS, AND STUDENTS
This questionnaire is a part of a research project at Iowa State University on improving instruction in modular-flexible scheduled schools. The research project covers schools in the Great Plains Area (Iowa, Missouri, Nebraska, South Dakota). The specific purpose of this research project is to improve instruction in the four teaching-learning modes of Large Group Instruction, Small Group Instruction, Independent Study, and Open Labs.

Large Group Instruction (LGI) in the New Design Schools is that which, because it involves a large number of students, places primary emphasis on presenting materials with a minimum of interaction. Small Group Instruction (SGI) in New Design Schools has as its primary emphasis a face-to-face contact in group interaction. Instruction in which the student engages in activities independent of other students and usually independent of teacher direction is Independent Study (IS). Open Labs (OL) include those physical facilities for which special equipment and tools are needed to enable students to work independently and in small groups and to practice skills, to experiment, and to apply ideas suggested in Large Group Instruction. Open Labs also function most appropriately when teachers are available for independent help.

After reading each statement, please circle the “A” (agree) if you agree with the statement or the “D” (disagree) if you disagree with the statement. After you have made this decision, please indicate how strongly you agree or disagree with each statement by circling one of the numbers. Circle 1 if you only slightly agree or disagree with the statement. Circle 5 if you very strongly agree or disagree with the statement. The numbers 2, 3, or 4 may better describe how strongly you agree or disagree with the statement. If this is the case, then circle the appropriate number.

After each statement be sure to circle both a letter and a number, unless you are completely undecided whether you agree or disagree with the statement. If you are completely undecided, circle both “A” and “D”, but do not circle any numbers. This will indicate that you neither agree nor disagree with the statement.

Among the following statements there are no right or wrong answers. In this research project the answers that reflect your own feelings will be most helpful.

<table>
<thead>
<tr>
<th>Statements Concerning Open Labs</th>
<th>A</th>
<th>1 2 3 4 5</th>
<th>D</th>
<th>1 2 3 4 5</th>
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<tr>
<td>1 Teachers are available for independent help, planning, and follow-up during Open Labs time.</td>
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<tr>
<td>2 It is very important to have resources available such as libraries, playing fields and gymnasiums, office machine centers, music practice rooms, instructional materials centers, audio-lingual language rooms, science research laboratories, reading-skills laboratories, study centers, machine shops, home economics rooms, etc. These resource centers are available to you during Open Labs time.</td>
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3 Open Labs should be at least one hour in length. The Open Labs in our school allow for this amount of time.

4 Our school schedule allows enough mods each week for Open Labs.

5 Open Labs should help develop rapport between teacher and students and also motivate students. These purposes are being achieved in our Open Labs.

6 Open Labs should develop self-reliance on the part of the students that cannot be developed in a Large Group Instruction area, because of the lack of a one-to-one relationship. In our school, Open Labs serve this purpose.

7 Open Labs should expand your ability in Independent Study and also serve the purpose of allowing each student more work in their areas of interest, and allow for make-up, catch-up and speed-up time. The Open Labs in our school provide for these functions.

8 There are provisions for students to do standardized laboratory exercises when they are unable to produce original work.

9 Enough time is allowed in each Open Lab mod to achieve objectives which were initiated during that mod.

10 In Open Labs the purposes are easily understood, the directions are clean-cut, the procedures are simple and direct, the materials are familiar to pupils, and the applications of the findings are obvious.
After reading each statement, please circle the “A” (agree) if you agree with the statement or the “D” (disagree) if you disagree with the statement. After you have made this decision, please indicate how strongly you agree or disagree with each statement by circling one of the numbers. Circle 1 if you only slightly agree or disagree with the statement. Circle 5 if you very strongly agree or disagree with the statement. The numbers 2, 3, or 4 may better describe how strongly you agree or disagree with the statement. If this is the case, then circle the appropriate number.

After each statement be sure to circle both a letter and a number, unless you are completely undecided whether you agree or disagree with the statement. If you are completely undecided, circle both “A” and “D”, but do not circle any numbers. This will indicate that you neither agree nor disagree with the statement.

Among the following statements there are no right or wrong answers. In this research project the answers that reflect your own feelings will be most helpful.

### Statements Concerning Independent Study

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1 Independent Study methods are offered to you in all areas of interest.

2 Your school has helped you to develop the skill and responsibility to study independently.

3 In your school you have been offered the opportunity and allowed to complete IS work in all curriculum areas.

4 Independent Study is more valuable than regular (traditional) homework.

5 Students should (in most situations) meet with supervising teachers at least once a week to confer about their Independent Study projects.

6 Special physical facilities are needed in order to implement an Independent Study program. It is important for students to have a quiet area where they can pursue their Independent Study projects.

7 Students should be excused from certain class activities or for the complete course when they feel that Independent Study and research are more beneficial.

8 Students should be able to choose their own Independent Study projects with teacher approval.

9 Independent Study occupies at least 40% of a student’s time in your school.

10 In your school one of the major goals of Independent Study is to develop in all students the skills to learn on your own, and also the willingness to accept the major responsibilities for your own learning.
STUDENT QUESTIONNAIRE

Male: ______ Female: ______

After reading each statement, please circle the "A" (agree) if you agree with the statement or the "D" (disagree) if you disagree with the statement. After you have made this decision, please indicate how strongly you agree or disagree with each statement by circling one of the numbers. Circle 1 if you only slightly agree or disagree with the statement. Circle 5 if you very strongly agree or disagree with the statement. The numbers 2, 3, or 4 may better describe how strongly you agree or disagree with the statement. If this is the case, then circle the appropriate number.

After each statement be sure to circle both a letter and a number, unless you are completely undecided whether you agree or disagree with the statement. If you are completely undecided, circle both “A” and “D”, but do not circle any numbers. This will indicate that you neither agree nor disagree with the statement.

Among the following statements there are no right or wrong answers. In this research project the answers that reflect your own feelings will be most helpful.

Statements Concerning Small Group Instruction

1. You have discussed and thoroughly understand what constitutes SGI.

2. Teachers dominate the Small Groups rather than being accepted as part of the group.

3. Small Groups provide an opportunity to share and gain for people of all abilities and interests.

4. Approximately twenty per cent of your total school time should be spent in SGI. In your school there is enough time in the SGI mods for thorough discussion.

5. In SGI student-led discussions are more productive than teacher-led discussions.

6. Small group instruction is too informal, there is too much "of-the-subject" talk.

7. Too much time is spent in SGI that could be put to better use in Independent Study.

8. One person often dominates Small Group discussion.

9. In your school SGI periods are used to further explain and add to the material present in LGI.

10. In your school students are allowed and encouraged to enter into the planning of SGI activities.
STUDENT QUESTIONNAIRE

Male: _______ Female: _______ 142

After reading each statement, please circle the “A” (agree) if you agree with the statement or the “D” (disagree) if you disagree with the statement. After you have made this decision, please indicate how strongly you agree or disagree with each statement by circling one of the numbers. Circle 1 if you only slightly agree or disagree with the statement. Circle 5 if you very strongly agree or disagree with the statement. The numbers 2, 3, or 4 may better describe how strongly you agree or disagree with the statement. If this is the case, then circle the appropriate number.

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Among the following statements there are no right or wrong answers. In this research project the answers that reflect your own feelings will be most helpful.

Statements Concerning Large Group Instruction

1 Teachers present only materials in LGI that are not readily presentable or obtainable from any other source.

2 Handouts should be given to students and completed in advance of the Large Group presentation so that the material may be reinforced by the student as he listens to the lecture.

3 Twenty-five to thirty-five minutes is ample time for LGI because student’s attention span is usually within this range of time.

4 Physical facilities and equipment are conducive or adequate for LGI.

5 There are satisfactory arrangements or methods whereby the audience may ask questions in Large Group participation if something is missed.

6 The person most capable of presenting the LGI material is the one who is actually assigned this task. This person actually relates well to the audience.

7 Large Group Instruction is used only for tests, dispensing materials, explaining assignments, and motivation.

8 Students should be excused from Large Group Instruction if they have successfully completed the area of work to be discussed.

9 The size of a Large Group is not important since there is usually little audience participation.

10 Large Group Instruction periods should not exceed 60 minutes.