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THE UNIVERSITY OF ALBERTA

A COMPARISON OF TEAM TEACHING AND AUTONOMOUS TEACHING IN HIGH SCHOOL ENGLISH AND SOCIAL STUDIES

by

© DAVID ALEXANDER DOWNIE

A THESIS

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FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "A Comparison of Team Teaching and Autonomous Teaching in High School English and Social Studies", submitted by David Alexander Downie in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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ABSTRACT

The study compared the effectiveness of team teaching with autonomous teaching over a period covering the three final years of high school (Grades X, XI, and XII).

The project was carried out in two high schools within the same school division. The experimental school contained two teaching teams of the collegial type, each responsible for one subject across all three grade levels. There were six members on the English team and four on the social studies team with the remainder of the experimental school staff being autonomous teachers. The control school had the same number of teachers as the experimental school in English and social studies and the entire staff worked as autonomous teachers. At the start of the project there were 115 students in the experimental group and 102 students in the control group. At the end of the three years the number was 70 and 53 respectively.

The independent variables of student characteristics, pupil teacher ratio, teaching supplies, and teacher competence were examined and found to be approximately equivalent between the two schools.

In the area of achievement, the criterion measures were the Social Studies XI, English XI, and English XII external Department of Education examinations administered in June of each year.

The covariate measures were the Grade IX external Department of Education examinations in the respective subjects.

A Q-Sort instrument was the criterion measure for responsibility and the Student Opinion Survey instrument measured school subject rating. In both instances, the covariates were the scores from the same instruments administered in the first year of the experiment. A Teacher Perception Scale and a student questionnaire measured the other dependent variables.

In all statistical analyses a probability level of .05 was accepted as significant. The significant differences were:

1. Achievement in English XI favored the team mode and in English XII it favored the autonomous mode; achievement by the lower ability group favored the team. Within the team mode females did significantly better than males.

2. Responsibility acceptance was greater for the lower ability group in the team mode than in the autonomous.

3. Subject rating was higher for English XII in the team group than the autonomous. Lower ability students rated Social Studies XI higher in the team mode than did their counterpart in the autonomous.

4. Teacher perceptions indicated greater satisfaction of team teachers than autonomous in feedback and internal capabilities.

5. Student preference for the team mode was indicated by 69 of the 70 students in the experimental group.

ACKNOWLEDGEMENTS

The successful completion of this study was dependent upon the cooperation and support of a great many people. The writer is particularly grateful to the students and staff in the two schools involved. Their interest and participation over the three years was vital and rewarding.

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Most of all, the writer wishes to express appreciation to his wife, Margaret, whose sympathetic support, wise counsel, and technical skill were continually offered even through the flood, fire and pestilence which she suffered.

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CHAPTER I

THE PROBLEM AND ITS SETTING

I. THE SETTING

"Innovation for innovation's sake" has been a criticism levelled at many of the changes introduced during a period of dramatic innovative activity. Those who made such criticisms provided a useful service to education in challenging the innovators to provide evidence of the effectiveness of their innovations. The innovator, in turn, had responded initially to severe criticism of the system from such writers as Bestor (1956), Rickover (1959), Smith (1954), and Conant (1959), who had mounted the offensive in the so-called "Great Debate". These attacks were followed by an unusual willingness upon the part of educators, governments, and the tax-paying public to undertake and support an extensive program of change and experimentation.

Although there were many major curriculum research projects supported by adequate supplies of funds and personnel, most of the innovative activity was not founded on any theoretical base but largely prompted by a desire to find a better way, whether through trial and error or "climbing on a band wagon." Even the massive undertaking of the National Association of Secondary School Principals in its studies on staff utilization did not attempt to produce any definitive research on the effects of the various projects. Downey (1965) still found it necessary

to report that many attempts at innovation in education lacked a research base.

It was the insistent need for change and the countering concern about the lack of research data that led the writer to examine critically the area of staff utilization. The specific choice of team teaching was prompted by readings which indicated a logical potential for the team approach but offered minimal research evidence. From such a beginning the problem took its form.

II. THE PROBLEM

The general problem was whether or not there would be a significant difference between the effects of two teaching modes (autonomous teacher and teaching team) on student behavioral outcomes.

The literature dealing with this general problem contained a minimum of empirical evidence and that which was available tended to indicate no significant differences between team and autonomous modes of teaching. On the other hand, the reported comments of students about team teaching referred to increased interest in the school subject, better understanding, a more critical approach to subject matter, and development of responsibility through seminars and independent study. These responses raised several questions which called for additional research and therefore the researcher chose those areas which had been previously identified by both the control

school and the experimental school as specific objectives. This approach limited the questions to the areas of achievement, responsibility and interest in school subjects.

In examining the reported reactions of teachers, the comments most frequently referred to professional development and the advantages of cooperation. The question here then, narrowed to whether or not teachers had real differences with respect to specific factors affecting their teaching. The factors were drawn from the theory outlined in Chapter II.

Specific Questions

1. Are there differences in academic achievement between students under the two teaching modes?
2. Is student willingness to accept responsibility affected by the teaching modes?
3. Is student rating of school subjects affected by the teaching modes?
4. Do teachers involved in the two modes have different perceptions about the factors which influence their teaching activities?
5. Do students prefer one teaching mode over the other?

Definitions

Team teaching. This section contains the various definitions given by authorities as well as the definition which was adopted by the experimental school involved in this research pro-

ject.

Shaplin used this definition:

> Team teaching is a type of instructional organization, involving teaching personnel and the students assigned to them, in which two or more teachers are given responsibility, working together, for all or a significant part of the instruction of the same group of students. (Shaplin and Olds, 1964, p. 15)

Singer defined team teaching as:

> An arrangement whereby two or more teachers, with or without teacher aides, cooperatively plan, instruct and evaluate one or more class groups in an appropriate instructional space and given length of time, so as to take advantage of the special competencies of the team members. (Beggs, 1964b, p. 16)

Trump used a variety of definitions in his writings but his basic reference is to:

> An arrangement whereby two or more teachers and their aides, in order to take advantage of their respective competencies, plan, instruct and evaluate, in one or more subject areas, a group of elementary or secondary students equivalent in size to two or more conventional classes, making use of a variety of technical aids to teaching and learning in large-group instruction, small-group discussion and independent study. (Trump and Baynham, 1961, p. 30-31)

The staff of the experimental school did not particularly quarrel with any of the definitions quoted here but did state its own definition as follows:

> Team teaching is a procedure involving the positive cooperation of a group of teachers for the purpose of planning, presenting, directing and evaluating a program of instruction in any selected subject area. (Manitoba Teachers Society, 1964, p. 5)

By October, 1964 the school had added the words "to a common group of students," to its definition of team teaching. This represents more a completion of the statement than any change in

emphasis and therefore, the basic concept remained unchanged throughout the course of the experiment.

Team Teaching Mode

This term is used in the study to identify the specific approach to organization and teaching used in the experimental school; that is, collegial teams (teams composed of professional teachers of equal status) in one subject area, responsible for instruction across all grades (X, XI, XII).

Autonomous Teacher Mode

This term is used in the study to identify the approach taken in the control school. The individual teacher was assigned a number of specific classes of students and given freedom to teach as he wished within the limits of the provincial program of studies.

Academic Achievement

The term "academic achievement" as used in the study, refers to the score obtained by a student on the grade eleven or grade twelve Departmental examination.

School Subject Rating

The term "subject rating" as used in the study, refers to the total score assigned to a subject by a student on an instrument called the "Student Opinion Survey" which was designed to measure student rating of school subjects through questions relating to subject matter,

the student group, and the teachers.

Responsibility

The term "responsibility" as used in the study refers to the total score obtained by a student on the "Q-Sort" instrument which was designed to measure the level of responsibility which the student is prepared to accept and the level of responsibility which the student perceives his teacher believes a student should accept.

Teacher Perceptions

As used in this study, the term teacher perception score refers to the degree to which the teacher finds that the mode within which he teaches (autonomous or team) satisfactorily provides for feedback from students and colleagues, adjustment to external influences, and effective use of teacher competence. The instrument used was the "Teacher Perception Scale."

III. HYPOTHESES

The specific questions posed in section II of this chapter have generated a number of testable hypotheses which are the focus for the design of the research undertaken in this study. These hypotheses have been grouped into five major sections to parallel the specific questions already mentioned.

The general hypotheses are:

A. Academic Achievement

There are no differences in academic achievement between students under the autonomous mode and students under the team teaching mode.

B. Responsibility

There are no differences between the level of responsibility accepted by students under the autonomous mode and by students under the team mode.

C. School Subject Rating

For the subjects involved in the experiment, there are no differences between the ratings given by students under the autonomous mode and by students under the team mode.

D. Teacher Perceptions

On questions relating to the teacher's perception of the mode within which he is teaching, there are no differences between the autonomous and team teachers.

E. Student Preference

The students of the experimental group show no preference between the team mode and the autonomous mode.

Questions concerning the source of hypotheses and their relevance to the study should become clear as the work of other

researchers and the theories are examined in the Review of the Literature. The detailed elaboration of the general hypotheses into statistical hypotheses is given in Chapter III which describes the experimental design. Here also is provided a general rationale for the choice of the sub-groups which are examined.

In Chapter IV the data are displayed with an interpretation of the findings for each group of hypotheses. (Here the intention is to describe in general terms the information displayed in the tables.) The explanation of why certain differences appeared has been reserved in most instances for the conclusions in the final chapter. Implications for further research are also outlined in the concluding chapter.

CHAPTER II

REVIEW OF THE LITERATURE

I. INTRODUCTION

Writers about innovation have tended to reach general agreement on a rather broad set of stages through which the process of change moves toward adoption. Heathers (Miller, 1967) in considering the planned development and utilization of an innovation suggested four stages:

1. The analysis of the tasks that are to be accomplished and how the innovation can be expected to achieve them.

2. The design or blueprint for the innovation that spells out its features.

3. The construction and testing of prototype models. In devising a workable model it is often necessary to change the initial design. Extensive field tests are necessary and they must include developing procedures for implementation and the measuring of outcomes.

4. Dissemination includes the preparation of materials and procedures designed to help school leaders decide whether or not the innovation would benefit them.

In an attempt to establish some order to the examination of the literature, a set of headings similar to the stages of an innova-

tion will be used.

Since Heathers indicated a frequent necessity to adjust design in the construction of models, these two elements will be treated under the single topic, development of models. Heathers combines the testing of models with the construction phase but for the purpose of this study it will be more convenient to treat them separately. The first and last phases will be used essentially as defined by Heathers. These divisions are not mutually exclusive and therefore reference to a study may appear under more than one heading.

After giving attention to the literature dealing with task analysis, development of models, testing, and dissemination, a brief analysis of the present stage of research will indicate the basis for the questions raised in this study. This chapter will conclude with some attention to a possible theoretical base for team teaching which provides a rationale for that part of the study relating to teacher perceptions.

II. THE LITERATURE

Task Analysis

Much of the work done in this area did not reach publication because it was preliminary to the major undertaking of a school or system and therefore was not reported. However, those studies that are available give a cross section of the type of work which was generally the forerunner of successful innovation in team teaching.

The most extensive program in this phase of the development was without question the "Commission on the Experimental Study of the Utilization of the Staff in the Secondary School" (Trump and Baynham, 1961). This study, initiated in 1956, sponsored over one hundred projects across the United States to examine such areas as space, time, schedules, facilities, personnel, materials, and administration.

In the same year the Harvard Graduate School of Education took the first steps toward the implementation of its School and University Program for Research and Development (SUPRAD). Dean Keppel's initial presentation to the Fund for the Advancement of Education indicated that his prime concern was to encourage a joint university-school examination of the "policies and organization of American public education" (Morse, 1960). This involved an investigation into the best kinds of grouping for different learning activities such as listening, reading, or watching. It also involved an analysis of the nature of teaching in an attempt to determine whether or not all teaching jobs were the same. The findings from these analyses provided a basis for the Harvard group's development of the team approach in both elementary and secondary schools.

In its initial year the Claremont Teaching Team Program (Polos, 1960) took a slightly different approach to the task analysis phase of innovation. The Claremont group had already accepted the basic concept of teaching team but undertook an intensive examina-

tion of current teaching-learning tasks in order to establish an appropriate structure for the team. This program of analysis was carried out by a widely representative group from both professionals and laymen over a period of approximately seventeen months.

The Beggs (1964) story of the introduction of the Trump plan at Decatur, Illinois, deals basically with dissemination but it has a section describing the task analysis activities undertaken by the staff preliminary to the adoption of the team teaching plan. The following topics were examined:

Theories of teaching and learning

The use of technological aids

The place of programmed instruction

Factors affecting student like or dislike of subjects

Instructional procedures

Kinds of tasks best performed by each teacher

The needs of learning with respect to length and frequency of time allocation

From an intensive study of those topics the Decatur staff moved toward the development of their particular model.

The four approaches to the task analysis phase dealt with a wide range of topics but of common concern was a basic attention to what teachers do and how students learn. As the findings of these various analyses were refined and organized, each group

developed its own model for a teaching team.

The Development of Models

In this section attention will be focused on attempts made to develop models of teaching teams.

In preparing the report of the "Commission on the Experimental Study of the Utilization of the Staff in the Secondary School," (Trump and Baynham, 1961) Trump moved the project into its second phase. He developed a number of designs for innovation on a wide variety of topics but for the purposes of this section, the model for team teaching is of prime importance. Trump's model of a team involved a full hierarchical structure of master teacher, teacher, assistant teacher, and aides. He proposed that the basic program include large group instruction to groups of one hundred or over, seminars for groups of twelve to fifteen, and independent inquiry. He suggested that an appropriate distribution of time might be 40 per cent to large group instruction, 20 per cent to seminars, and 40 per cent to independent inquiry. He further suggested that both time and space would need to be flexible to accommodate the new approach.

The model outlined by Trump was put into operation as a total package with the opening of the Ridgewood, Illinois, high school in September, 1960. Trump's basic model for a total program was also used for the Decatur-Lakeview plan but with one important difference--the Decatur teams were of the collegial type, that is,

the team was composed of professional teachers of equal status.

In the meantime the Claremont Graduate School had completed its task analysis stage and developed a model to be tested on a pilot basis in 1958. The Claremont group described their design in the following terms:

> In its essence, a Claremont Teaching Team is an instructional unit within a school (a school-within-a-school). This unit is a combination of (1) a distinct student group, (2) a small faculty group with complementary talents responsible for teaching the student group, and (3) certain persons who assist the teachers and students. For the purpose of description of this unit, the student group may be regarded as the student team, the faculty group as the faculty team, and the assistants as auxiliary personnel. (Mitchell, 1963, p. 2)

As part of their design the Claremont group also produced a set of hypothetical advantages of teaching teams which they hoped to test. These advantages were:

1. Practical and effective in-service education through frequent team meetings.

2. Marked success in inducting new teachers into school systems by using interns as team teachers.

3. The use of aides to release teachers from routine duties.

4. Teacher involvement in planning and developing team curriculum because of team structure.

5. Recognition for outstanding teachers through selection of team teachers and election of leaders.

6. Because of team structure, the ability of the team to form large and small groups for instruction, from one teacher for one

student, to one teacher for two hundred students.

7. Because of the team structure, the ability to group and re-group frequently by achievement, ability, or interest levels.

8. At the elementary level, the ability to develop exchange teaching opportunities among the team teachers in order to exploit teachers' special talents, knowledge, and training.

9. Improved guidance from the planned exchange of information about students and the atmosphere of fellowship with the team.

10. Improved correlation of subject matter because of co-operative planning in team meetings.

11. Through team leaders and team meetings, the identification and use of talented citizens and other educational resources of the community.

12. The planning of field trips for team students and the reduction of interference from field trips with other teachers' classes.

13. Because of their children's common experiences, increased interest and involvement of parents.

14. Because teams can be kept together for more than one school year, the organization to develop sequences of content and intellectual processes.

15. Improved climate of motivation because of the accent upon individual identity and team spirit.

16. Because of the team structure, the best use of teacher talent which should yield the highest quality of instruction.

17. Because of varied grouping and presentation, greater student interest.

A later development of the model proposed by the Claremont group was published by Brownell and Taylor (1962). A number of variations were suggested for both the elementary and secondary schools, but all within the basic framework of the full hierarchical structure favored by the Claremont group. The secondary school variations fit the pattern shown in the numbered section below.

An examination of the various models developed indicates two general dimensions to each model. The first dimension relates to the four variations of vertical and horizontal organization within the team. The second dimension identifies the relatonship of the personnel employed in the team.

Vertical and Horizontal Types

1. A team working in one subject area at one grade level.
2. A team working in one subject area at multi grade levels.
3. A team working in multi subject areas at one grade level.
4. A team working in multi subject areas at multi grade levels.

TABLE I

BASIC TEACHING TEAM MODELS

PERSONNEL TYPE	DEVELOPED OR USED BY	CHARACTERISTICS
FULL HIERARCHICAL	TRUMP SUPRAD CLAREMONT	At least two levels of professional staff and some non-professionals in each team, e.g. master teacher, teacher, assistant teacher, and aides.
SEMI-HIERARCHICAL	Many schools in the "trial" stage	Less than the full range, e.g. teachers and teacher aides or teachers with one as a department head.
COLLEGIAL	BEGGS	All members of the team professionals of equal status.

Testing the Models

This section does not attempt to report all efforts to evaluate team teaching but does provide a reasonable cross-section of the kinds of testing attempted including evaluations of the three basic types of team as identified in Table I. The reports are not organized in any particular grouping but as far as possible, the type of team organization has been identified for each study.

The Claremont teaching team program. This extensive

study used as its basic evaluative device a series of questionnaires administered each year to students in teams and not in teams, to teachers in teams and not in teams, to parents of students in teams and not in teams, and to administrators of team schools. The fourth annual report of the project contains this statement in summary of the questionnaires:

> The Team Program continues to be quite popular with those groups working in or connected with teams; substantial majorities of all groups experienced in team operation wish to continue. The team experiment does not seem to have had the effect, however, of increasing substantially the desire of those groups not in it to join.
>
> According to teachers and administrators in the Team Program, the team has had a positive effect in the key areas of curriculum, guidance and counseling, in-service education, student interest and motivation, parent attitudes and opinions, increased pleasure and satisfaction in teaching, and individualized instruction. In addition, the teachers believe the Team Program has helped bring about more effective correlation between subjects.
>
> Perhaps the most general effect as interpreted by the teachers is their own increased pleasure and satisfaction in their work. This is manifested at several points in the questionnaire. Such factors as interaction with colleagues, the flexibility of the program, and the use of the teacher aide are regarded as permitting them to bring their talents more effectively to bear on the students, producing more and better learning with consequent professional satisfaction. Many of the conditions implicit in the hypotheses of the team experiment are being experienced by the teachers according to their own report and are liked by them.
>
> Team students believe that many of the conditions they themselves regard as important to their team classes are actually present in their classes; they believe this to a much greater extent than do non-team students in regard to regular classes.

> The administrators, more than any other groups, attribute numerous benefits to the Team Program; all of them in 1963 wished to continue the program in their schools.
>
> Parents responding also tend to be very laudatory of the Program; they particularly mention such factors as increased interest, motivation, and achievement of their children. Their objections to the Program are insignificant in number.
>
> In so far as the type of evidence obtained by questionnaire can indicate, the Team Program as a whole seems to be producing results substantiating many of the original hypotheses of the experiment. (Mitchell, 1963, p. 45)

It is unfortunate that, with the length of time involved in the project, a serious attempt was not made to conduct a controlled longitudinal study on a number of variables. However, it may be convincingly argued that coming at the very leading edge of experiments in teaching teams, it was more important to make a wide variety of tentative probes into types of teams and situations with attitudes being the prime concern of evaluation.

Similar but less extensive approaches to the testing of team teaching were conducted in the full scale projects at Ridgewood and Decatur with findings parallel to those quoted from the Claremont report.

All other reports in this section will be specific studies of individual projects in one or two subject areas over a relatively short period of time--generally a year.

Thomson's study of achievement differences between team and traditional classes. In this study Thomson (1963) attempted to achieve control of the independent teacher variables by having both

modes of instruction carried out by the same teachers. The team was of the collegial type in one subject area and one grade level. There were 209 senior students involved in the project. The subject matter was also closely controlled in that it was a totally new and complete unit of anthropology taught for six days. The single dependent variable was taken as achievement. The measurement of achievement was by a multiple choice achievement test of forty-six items administered immediately upon completion of the unit and again after a lapse of twenty days. The results showed a significant advantage to the experimental group after twenty days but a significant advantage to the control group immediately upon completion of the unit.

In this study the length of treatment would appear to be much too brief a period to allow students and teachers to adjust to a new mode of teaching. The control group would, in all probability, be contaminated by the use of the same teachers for both the team and independent modes of instruction.

White's study of team teaching in high school biology. White's (1963) research involved a collegial type team in one subject area and one grade. He attempted to control the teacher variable by having the same teachers carry out both modes of instruction to students taking high school biology for a two-year period. There were 192 students in the experimental group and 248 students in the control group. Student achievement in biology was taken as the only dependent variable to be measured but the analysis of the criterion measure was con-

ducted between sex sub-groups and intelligence sub-groups as well as the total group. White found no significant differences between the experimental and control modes in any of the analyses.

In the list of characteristics of the two groups as White observed them in operation, it would appear that the control group had several of those usually claimed for teaching teams. Briefly, the characteristics of the control group were observed to be:

1. Students in the control classes encountered more flexibility in the subject matter presented and in the teaching procedures utilized.

2. The teachers had closer contact with the students from the standpoint of opportunity for interaction.

3. Teachers of these groups seemed to be more aware of student difficulties and individual problems.

4. Students had more chances to take part in classroom activity because of less necessity for rigid adherence to a planned curriculum.

Consequently, one might suspect that White was investigating two groups of essentially the same kind of teaching. Once again the problem of contamination between the experimental and control modes might have been critical.

The Ginther and Shroyer study of team teaching in English and history. This research project (Ginther and Shroyer, 1962) appears to be the most comprehensive and carefully designed of all

the studies which have been reported in the literature. The study extended over a full academic year and involved grade eleven students of history and English. There were three two-member collegial type teams with each team being composed of one history teacher and one English teacher working at one grade level. The control group was divided into two parts--control group one which was taught by teachers involved in the teams and control group two which was taught by teachers who were not involved in the teams. The criteria were gain scores on: Co-operative English Test C2, Reading Comprehension; Co-operative American History Test: Nelson's High School English Test; Ohio Scholarship Test in American Literature; Sequential Tests in Educational Progress, Writing; Watson-Glaser Critical Thinking Appraisal.

The conclusions were:

> Only one variable, mechanics of writing, reveals a clear superiority for a control group . . . . . The experimental group demonstrated a similar clear superiority on two variables, writing and critical thinking, and approached a level of clear superiority in American history. The variables American literature and reading reveal no significant differences among the groups. (Ginther and Shroyer, 1962, p. 312)

The more detailed descriptive report indicated that both students and teachers were strongly in favor of the team teaching method. (Shroyer, 1962)

It is significant that control group one which was taught by teachers also involved in the team showed a score gain pattern much closer to the experimental group than did control group two. Unfor-

tunately Ginther and Shroyer gave no description of teacher characteristics which might help to indicate whether or not the variable was teacher difference between the two control groups.

Waters' study of team teaching in English. This investigation (Waters, 1968) involved a collegial type team in one subject and one grade. Three teachers taught the senior English students of a high school in 1965 using the traditional approach. The same three teachers taught the same program to senior English students of the same high school in 1966 using the team approach. Student achievement in English was the only dependent variable to be measured but the researcher analyzed the data for possible differences between sex sub-groups and intelligence sub-groups as well as the main groups. No significant differences were found between the experimental and control modes in any of the groups.

It is unfortunate that in this study no check was made to confirm that both groups of students were from the same population.

Chamberlain's study of team teaching in United States history. This study (Chamberlain, 1967) involved three semi-hierarchical teams in one subject area and one grade over a period of one year. There were 270 students in the experimental group and a similar number in the control group. Each of the teams was composed of two teachers, one part-time teacher, and one teacher's aide. The only dependent variable to be measured was achievement in United

States history. The analyses included the testing for differences in intelligence sub-groups as well as the total groups. The criterion measure was the Co-operative American History Test. Chamberlain's findings showed a significant difference at the .01 level in favor of the control mode for both the total group and the high intelligence sub-group. No significant difference was observed between the low ability sub-group scores. In a questionnaire eight-three per cent of the students of the experimental group indicated that they preferred to be team taught, believing that they developed greater skills in independent and group study and that the team method fostered critical thinking. The students' comments are particularly interesting in the light of Ginther's study and the general claims made for team teaching.

Jester's study of team teaching in eighth grade social studies and language arts. Jester (1966) reported on collegial type teams in one subject area and one grade level. The experimental group involved 197 students from one junior high school and the control group was made up of 262 students from a different junior high school. The researcher did not indicate any basis for considering the two groups of teachers to be from the same population but he did establish that the two groups of students did not differ significantly in the areas of basic skills in reading comprehension, vocabulary, language skills, work study skill, and in mental ability. The single dependent variable to be tested was achievement. Jester's findings

indicated no significant difference in social studies achievement. In language arts on the other hand, there was a significant difference at the .05 level in favor of the team taught group.

Scott's study of team teaching in ninth grade English. Once again the study (Scott, 1966) involved teams of the collegial type in one subject area and one grade. There were 163 students in one school and an equal number in another school. As in the Jester study, there was no indication of any concern for teacher equivalence between the two groups. Scott did establish that the two groups of students were from the same population with respect to mental ability and prior achievement in English. The criterion measures were the Co-operative English Expression Test A and the Co-operative Literary Comprehension and Appreciation Test. The findings indicated a significant difference at the .05 level in favor of the experimental group in grammar and in favor of the control group in literature appreciation.

The findings of this study are particularly interesting in that they would appear to be contrary to expectations based on the various claims for team teaching. On the basis of the claims it would be logical to expect that the more informal approach of seminars and individual inquiry would facilitate the development of "appreciation" in literature and that the more rigid traditional approach would be more effective in teaching the skills of grammar. Without a more explicit description of the two styles of teaching, Scott leaves the

reader wondering if, in fact, the traditional teachers were not less "traditional" than the team teachers.

Burrier's study of team teaching in social studies. This study (Burrier, 1963) departs somewhat from the general pattern in that Burrier surveyed a number of different team teaching projects in social studies under a variety of different situations. The criteria measures were questionnaires and the variables examined were:

> . . . . . design, purposes and goals, methods of selecting the participating students and teachers, reactions by students and teachers, pre-service and in-service education programs for teachers, evaluative techniques and programs, curriculum revisions, resulting problems, and a general appraisal. (Burrier, 1963, p. ii)

Burrier reached the following conclusions:

1. Team teaching offers many advantages over the traditional organization for instruction for both teachers and students.
2. Competencies of individual teachers are being utilized effectively through team teaching.
3. Staff members need additional preparation for team teaching through pre-service and in-service training programs.
4. Critical thinking and creativity receive no more emphasis in team teaching than in the more conventional programs.
5. Procedures in staff selection have resulted in the formation of competent teams.
6. Team teaching is encouraging some curriculum revision and modernization.
7. Community resource personnel, audio-visual aids, and additional instructional materials are enriching the educational programs. (Burrier, 1963, p. iii)

Burrier's research produced findings which are basically

supportive of the general statements made when the early experiments were introduced.

Some of the weaknesses believed to exist in the techniques and research designs described in this section have been indicated already but these and others are discussed in relation to the current study in the section headed "The Present Stage of Research." A summary of the findings reported in the studies is provided in Table II, on page 32.

Dissemination

The existence of a large body of promotional material well in advance of research literature gives strong support to the view that in the development of team teaching, dissemination has largely preceded testing.

If one accepts Heathers' (Miller, 1967) concept of dissemination as including materials for the successful adoption of innovation, the work of Trump far exceeded that of any other writer in this phase. Both before and after Focus on Change (Trump and Baynham, 1961) there appeared a vast array of pamphlets, articles, films, records, and film strips, covering a variety of topics but frequently incorporating the team teaching theme.

Second only to Trump as an advocate of team teaching, Beggs produced books, articles, and addresses on team teaching, and such related topics as flexible scheduling and independent inquiry.

His detailed account of how a team teaching program was implemented at Decatur-Lakeview high school provides a guide book to prospective adopters and summarizes his view of the advantages. Beggs' list of advantages is quoted here as representative of the sort of comment about team teaching to be found in the writings of many others listed in the bibliography:

> First, it gave most of the teachers a sense of pride in being a part of a bold attempt to do something to improve education. Lakeview teachers felt they were on the offensive in working toward the improvement of American public education. A missionary zeal developed for doing a job which really counted.
>
> Second, the Plan brought teachers of the same content background together to test ideas and share approaches and techniques. Increased satisfaction with teaching was apparent through the adult associations developed by the team relationships. There is a particular kind of loneliness in a self-contained classroom, in spite of the presence of thirty youngsters. This disappeared in the team teaching situation.
>
> Third, as teachers specialized in certain phases of the instructional process they generally received increased satisfaction. People like to do the things they are good at doing. As the teachers enjoyed their roles, they became more expert at teaching.
>
> Fourth, the attitude of the students toward teachers was altered. Teachers became helpers, interested listeners and reliable sources of knowledge in the students' eyes. Teachers liked this. A new attitude appeared in the school which raised the status of both students and teachers in the estimation of one another.
>
> Fifth, the independent study carried on by students was a source of pride and satisfaction to the staff. Independent study activities gave the staff a sense of being real teachers, in addition to purveyors of knowledge. Teachers saw the results of their teaching translated into student achievement. (Beggs, 1964, p. 174)

The book edited by Shaplin and Olds (1964) also is descrip-

tive of how to adopt team teaching but it relates more specifically to the hierarchical type of team developed by the Harvard group for the SUPRAD program. Many of the suggestions for planning and implementation are similar to those of Beggs.

Of particular importance to the dissemination phase is the work of two researchers Kavanaugh (1965) and Davis (1967) who prepared extensive bibliographies on the topic of team teaching. These are invaluable resources for those who wish to obtain further information before taking steps to adopt a program.

In concluding this section reference is made to four strictly Canadian studies and reports which display a marked similarity to literature produced in the United States.

The Dome study. Although the author of this report (Bunyan, 1965) indicates that one of his objectives was to draw conclusions about the value of team teaching for the Calgary system; it is essentially a survey of facilities and practices. Much information was collected which would be of positive assistance in planning for the introduction of a team teaching program, but any evaluation was limited to the kind of generalization appearing in most of the promotional literature.

Manitoba Teachers Society. A report (Manitoba Teachers Society, 1964) of the Manitoba Teachers Society was prepared by a committee of teachers who were involved in the team teaching project being reported in this dissertation. It was essentially a des-

cription of the background and implementation of that program.

Canadian Education Association. The study (Canadian Education Association, 1964) prepared by the Canadian Education Association gave a summary of the results of a survey covering such topics as facilities, staff, number of pupils, type of scheduling, and results. The "evaluation" section is quoted here to show the close parallel with the comments by Beggs:

Best features

a. Student interest:	- students more alert and receptive; - students "fired up" by specialist lectures; - students found subject matter more alive and meaningful.
b. Better preparation and presentation:	- exposes more pupils to better teachers; - teachers inspired to strive for better source and presentation of material; - each teacher is able to concentrate on one part of the work and give his best to it, while having the benefit of consulting with others; - gives scope for creative presentation; - better use of teacher's special talents;
c. Staff morale:	- teachers grow professionally in their team meetings; - obvious benefit to staff members because of cooperation; - eliminates repetition of lessons.

Worst features

a. Students:	- auditorium situation gives an unfortunate mental set as a place of entertainment; - students can be anonymous in a large group;

- weaker students can sit and be dormant.

b. Teachers:
- having unco-operative teachers is the worst feature;
- not all teachers have the necessary background and skill;
- some teachers simply cannot work in a team;
- one dull, uninspired lecture presentation can ruin the whole scheme;
- may put extra demands on harder working teachers.

Success in team teaching depends upon:

a. Teachers:
- knowledge, enthusiasm, and determination of the staff members involved;
- less on facilities and more on the teachers themselves and their determination to work together for more effective presentation;
- teacher interest, compatibility, and ease of co-operation;
- congeniality of personnel is paramount;
- everything depends on the sense of purpose, the dedication, and the flexibility of the teachers.

b. Planning:
- long term planning before starting;
- thorough and conscientious advance preparation of the timetable;
- close consultation prior to the lesson;
- flexible purpose than can be changed as the need arises;
- imagination in timetabling;
- adequate time off for planning.

c. Accommodation:
- adequate facilities;
- availability of space and special equipment.

Western conference on team teaching. "The Report of the Western Conference of Teacher Organizations" (Western Canada Con-

ference, 1964) represents just another summary of attempts at team teaching and reactions to the projects, except that this report includes a detailed proposal from the British Columbia Teachers' Federation for the gradual introduction of team teaching into a school. This plan offered one further aid in the dissemination phase of the team teaching innovation.

Although the model testing produced a variety of results, the findings of those studies which attempted to quantify data are summarized in Table II.

TABLE II

A SUMMARY OF RESULTS REPORTED IN THIS CHAPTER

Group	Number of tests showing N.S.D.	Number of tests with a significant difference favoring:	
		Team	Traditional
Achievement			
Total Group	4	4	3
Female Sub-Group	2		
Male Sub-Group	2		
High I.Q. Sub-Group	2		1
Low I.Q. Sub-Group	3		
Critical Thinking			
Total Group		1	

In the literature related to the dissemination of team teaching there appeared to be three consistent points of emphasis. There was invariably a concern about the need for thorough planning well before the proposed adoption. The second point was the identification of the advantages and disadvantages to be reaped from the team approach to teaching. Finally those involved in the dissemination process indicated a need for flexibility of space, time, and personnel in order to facilitate the implementation of a team teaching program.

III. THE PRESENT STAGE OF RESEARCH

There appears to be a definite conflict between the many claims for team teaching and the "no significant difference" findings of many studies. An examination of the reported research in this area has led the writer to the opinion that a number of gaps in the present body of research data need to be filled before the educator can accept the conclusion that there is no significant difference. Several of these gaps have been identified in the consideration of the individual research projects. However, they are summarized here and discussed within the context of the design elements of the present project which might focus new data on the unanswered questions.

The lack of a theoretical base, which is a characteristic of most of the studies reported, means that there will be no adequate

basis for making predictions, determining the critical variables or even understanding the basic characteristics of the teaching mode being examined. In this study an attempt will be made to indicate one area of theory and explore that element of the team mode through this focus.

The short length of exposure to team teaching has been another weakness of the majority of the studies. The nature of team teaching requires major adjustments by both teachers and students. Under such conditions a longitudinal study is highly desirable if not essential. The three-year period of this study should allow sufficient time for the necessary adjustments to take place.

In most studies of team teaching, evaluation has been limited to academic achievement. This is a further weakness in the present body of research. If teaching is directed at change in pupil behavior, it is necessary to identify and measure changes in significant behaviors other than those involving a knowledge of facts and an understanding of concepts. Of all the studies examined, only that undertaken by Ginther and Shroyer appears to have gone beyond the cognitive learnings. In the present study, the attempt to measure the development of responsibility and student interest in school subjects adds other dimensions.

It is important to identify the kinds of activities and processes that actually occurred in classrooms of the control and experimental groups. This has been attempted by White (1963) and also by

Ginther and Shroyer (1962). A replication of this research is necessary in other settings and therefore, has been attempted also in this study.

IV. SOME THEORETICAL CONSIDERATIONS

Since team teaching involves a method of organizing the teaching process and a method of organizing personnel, it may be profitable to investigate theories of teaching and organization in order to establish a theoretical base for the study of the operational aspect of teaching teams.

Theory of Teaching

Although there have been several probes into theories of teaching only two appear to have any degree of promise as a basis for the further investigation of team teaching. Shaplin (Shaplin and Olds, 1964) develops the idea of the nomethetic and ideographic dimensions of a social system as representing the team member's individual needs and role expectations with their possible conflicts and interactions within the formal organization. This model could provide an effective tool for the study of a team but since this particular study is concerned with the team more as a production unit, it is more useful to use the approach taken by Ryans in his "Theory of Instruction." (Ryans, 1963)

To fully understand Ryans' theory it may be useful to study

the material on General System Theory (Bertalanffy, 1956) upon which the "Theory of Instruction" is based; but for the purposes of this research a brief explanation of an "open system" should provide a satisfactory beginning point.

A system as used in the general theory context, is defined as:

> A set of elements or subsystems (each of which may possess some degree of independence but at the same time is an integral element of the larger ensemble), together with the relationships between the elements and between their properties. The elements, or subsystems, are centralized and organized by a communication network which permits interaction and makes for interdependence so that they function as a coordinated whole to produce some process and/or product which is unique to that particular system. (Ryans, 1963, p. 192)

> An open system may be defined, then, as a system that can be changed, or is adaptive and modifiable, and which engages in energy and information exchange, both with its component subsystems and with other systems which comprise its environment. An open system must be capable of receiving inputs and of producing outputs. But the inputs vary from time to time; and the outputs may be altered. These properties of modifiability and responsiveness permit a) maintenance of the steady state over periods of time, and b) cumulative change in a given direction. (Ryans, 1963, p. 193)

Taking into account the definitions of both Bertalanffy and Ryans, it would seem reasonable to state and for the purpose of this study, it will be assumed that a teaching team can similarly be considered as an open, self-organizing, self-regulating system and that in such a situation the individual teacher members of the team become open subsystems which are also self-organizing, self-regulating, and with a tendency to maintain a steady state within the system.

Although it is the output of the system in the form of teacher behavior which directly influences pupil behavior, the output is, in turn, a function of three classes of inputs: internal inputs in the form of the behavior capabilities and characteristics of the teachers; external inputs and feedback inputs. It is here then that it may prove useful to examine the operation of the teacher team as a system.

If, as is suggested the establishment of a team changes the nature of the system and its environment, it becomes important to determine whether the inputs are of the same kind and effect to the team system as they are to the autonomous teacher system.

In the present study, some of the internal, external, and feedback inputs identified by Ryans will be considered in terms of how their interrelationships may have been affected by the formation of a teaching team system.

The external inputs which Ryans identifies as the administrative context, the pupil behavior goal context, and the learning media or aids context, are described separately in this section but for purposes of prediction and hypothesis testing they are regrouped into the larger category of external inputs.

Administrative context. As a group of external inputs, some of the administrative influences will retain the same relationship with the team system as existed with the autonomous teacher system but many others will change. For example, matters such

as the grouping of students, scheduling of space, time, teachers, and pupils; and the allocation of materials become functions of the team and therefore move from external to internal inputs.

If the team has the capability to carry out these new functions there will be correspondingly fewer chances of uncoded or misunderstood inputs from the external environment causing stress in the system.

Pupil behavior goal context. Here Ryans is referring to pupil behavior toward which instruction is directed. This particular area represents another external input and is subject to considerable variation from situation to situation. However, under conditions where the team is recognized as having a high level of professional competence, it will be more likely to be granted a greater share in the determination of goals than would an individual teacher. If such were the case, the results would be similar to those indicated for the previous context, and tend to move from an external to an internal input.

Learning media or aids context. Identified by Ryans as an external input, the learning media or aids context also will become internal to the system to the extent that the team is able to procure, design, and produce all media required for the program of instruction. Under an effective team this context may readily become completely an internal input.

If, for the three external elements just discussed, the effect

of the team is as predicted, the teachers under the team mode should respond more favorably than autonomous teachers to the external input category of the Teacher Perception Scale.

Feedback input. This is a different category of input to the group described above but it is particularly relevant to the study in its teacher behavior and student response components. The team system, because of its several teacher subsystems, has a much greater capability to receive and code teacher and student feedback inputs. As a consequence, feedback will be more effective as an equilibrating mechanism and less likely to produce stresses incapable of reduction. For example, a teacher experiencing failure in communicating with a particular group of students may become frustrated and totally ineffective in an autonomous situation, whereas in a team approach the wider range of experience and technique may be able to interpret this teacher feedback in ways which will permit the modification of program and methods. If such is the case, the teachers under the team mode should respond more favorably than autonomous teachers to the feedback input category of the Teacher Perception Scale. In selecting items for inclusion in this category of the scale, parent feedback was accepted as an appropriate item to the total feedback group.

Internal capabilities. Ryans has suggested that the internal inputs and capabilities may be subdivided into: Physical-physiological characteristics, general capabilities, characteristic abilities-

capacities, characteristic teacher "behaving styles," characteristic effective sets, and retrievable information. If the creation of a teaching team transforms the individual teacher systems into a team system, the result should be a general increase in the range and depth of capabilities. If this is true then, teachers under the team mode would be expected to respond more favorably than autonomous teachers to the internal capabilities category of the Teacher Perception Scale. In developing the scale, such items as the choice of methods, lesson preparation, relations with colleagues, professional growth, and others were included in this category.

Organization Theory

As the establishment of teaching teams creates fundamental changes in the nature of the formal organization, it is essential to examine the implications of such changes in terms of organization theory.

Argyris (1962) has maintained that normal healthy development of an individual involves growth from passivity and dependence to activity and independence, from shallow abilities to deeper abilities, and that each individual will normally move along this continuum. However, the formal organization by its very nature tends to deny and frustrate this normal development in the individual employee. Argyris' view may be summarized in saying that self-actualization of the individual within the organization is a critical factor in the sur-

vival of an effective organization and in the continued mental health of the individual.

This basic position is supported and made particularly relevant for this study by Etzioni's (1964) contention that the closer the individual is to a full professional the more likelihood there will be of a conflict between the professional and the managerial functions. In other words, the more professionally oriented the teacher is, the more difficult will be the problem of self-actualization within the normal organization.

A wide variety of studies conducted by Bidwell, Blair, Butler, Chase, Francoeur, Walker, and Wiles, (Lundrigan, 1965) have indicated that teacher satisfaction is based on such factors as: involvement in planning, self-actualization, freedom to plan his own work, freedom from intellectual isolation, and the opportunity to choose teaching methods. Since the teaching team form of organization permits the individual actual involvement in the grouping of students, the allocation of time, the division of labor, the development of objectives, the choice of methods and materials, and the sharing of professional views, it may be that the teachers in the team situation will gain more satisfaction than would be expected to accrue under the normal type of organization.

A further problem for the study then, is to determine the extent to which the factors affecting teacher satisfaction are per-

ceived differently in the two types of organization, and whether or not they tend to be consistent with the theoretical considerations.

CHAPTER III

THE EXPERIMENTAL DESIGN AND STATISTICAL PROCEDURES

In this chapter the design of the study is presented in detail. Included are descriptions of the groups, the treatments, the teachers, and the instruments. It provides a summary of the assumptions and delimitations and a statement of the statistical hypotheses with the procedures used to test them.

I. THE EXPERIMENTAL AND CONTROL SCHOOLS

The experiment being reported was conducted in the two high schools of a suburban city during the period September, 1963 to June, 1966. The project started with all the grade X university entrance students from each high school. This involved 115 students in the experimental school and 102 students in the control school. At the end of the three years the number who had completed all tests were seventy and fifty-three respectively.

Gross Similarities and Differences Between Experimental and Control Schools

Staffing. The control and experimental schools operated within the same school division and therefore, teachers were assigned to both schools by the divisional superintendent. When interviews were being held to fill positions in one specific school, the principal

would be invited to attend and share in the decision-making process. During the interviews for the experimental school, the candidates were told that there would be attempts made to take a different approach to teaching and that this might involve team teaching.

Administration. Each school was administered by a principal and one assistant principal.

School plants. The control school had been built in three stages extending over the period from 1949 to 1961. It contained standard classrooms and laboratories, two gymnasia, and a lunch room. The experimental school was a new building with standard classrooms and laboratories except that two classrooms were provided with a partial partition to form a total of four seminar rooms and a lecture room was created by omitting the wall between two classrooms placed end to end. The experimental school also had a gymnasium, a lunch room, and a library which was one-half classroom larger than that of the control school. The seminar and lecture rooms were provided after construction had started on the school as a result of the staff decision to attempt team teaching. The larger library was a reflection of current attitudes to library use.

Student population. Although the total community served by the two high schools represented a cross-section of social, economic, and cultural groups, the boundary between the schools was such as to assure that each student body possessed essentially the same characteristics. For the purposes of this study then, the two groups of

students are assumed to be from the same population. This conclusion was confirmed by the opinions sought from social workers, public health nurses, and superintendent of schools, as well as by the findings of demographic studies prepared by the Metropolitan Corporation of Greater Winnipeg.

On the Otis Mental Ability Test administered in grade IX, the mean score for the control school was 119.9 and for the experimental school 119.7.

Both schools offered University Entrance and General Course programs throughout the three years. The control school also offered the Business Education Course. This meant in effect, that the experimental school was offering work to the full range of academic students (General Course provided for a slightly lower ability level or the same level of students who did not wish to attend university) and the control school provided this plus a segment of vocational students.

The Autonomous Mode

In making the necessary arrangements with the control school to cooperate in the experiment, the researcher made it clear that the teachers were to feel free to carry out their regular program of instruction as they wished. There was no attempt to prescribe what autonomous teaching was to be like.

During the three years of the project, social studies and English received the amounts of instructional time specified by the

Department of Education. In general, teachers were assigned to certain classes by the principal and they were free to carry out the instructional program as they wished. There was no formal attempt to provide for consultation between teachers in the same department although it was normal to consult about such matters as the selection of optional texts and the setting of examinations.

Interviews with the teachers and discussions with the Department of Education inspector established that there was considerable variety in the teaching techniques used by the autonomous staff. Several teachers used fairly consistently the presentation, assignment, recitation type of technique with a minimum of open discussion in class. One teacher made extensive use of long term assignment sheets with students doing work on their own within the assignment framework. Another teacher made some use of discussion in class (up to 10 per cent of total time) with the majority of the interaction being between teacher and pupil. Teachers generally felt the pressure of time and volume of work to be covered as factors limiting the possibility of more open classroom situations or innovative practices. There was no identification or criticism of the source of this pressure--it was just a fact of life. Without exception, the reports on individual teachers from principal, inspector, and superintendent indicated above average competence.

The Team Teaching Mode

Preliminary planning. The principal of the experimental school was appointed ten months before the commencement of classes and although he continued as principal of another school, he worked closely with the superintendent in the selection of staff. Regular staff meetings were held for seven months prior to school opening, thus permitting extensive planning and a thorough investigation of a variety of staff utilization projects. It was during this period that the staff reached the decision to attempt team teaching in English and social studies. Early in the planning sessions each subject group of teachers elected a chairman (without additional salary) who co-ordinated the activities of the group.

Operational definition. In terms of the types identified in Chapter II, the experimental school used the collegial team in one subject area and across all three grade levels of the school. The definition of team teaching as accepted by the staff in the experimental school stated:

> Team teaching is a procedure involving the positive co-operation of a group of teachers for the purpose of planning, presenting, directing and evaluating a program of instruction in any selected subject area. (Manitoba Teachers Society, 1964, p. 1)

Team procedures. In the same statement which contained the definition, the staff briefly outlined the team procedure as follows:

> One team in History and one team in English cover the three grades. Large groups (75 - 140) are used to introduce new topics, provide background, motivation etc., carry out testing, and

> review. Small groups (15 - 18) are used to clarify issues, exchange views, develop skills of critical thinking and consolidate ideas. The gathering of supplementary information, research on special topics and mastery of basic facts, is carried out in periods of independent inquiry which normally take place in the library. (Manitoba Teachers Society, 1964, p. 5)

Observations of the teams at work have produced more detailed comments on the procedure.

Throughout the three-year period of the project, social studies and English were assigned the amounts of time specified by the Department of Education. Except where grade enrolments exceeded 140 students, all of one grade were scheduled at the same time for English and social studies and the team was assigned the responsibility of breaking down the blocks of time and students into appropriate instructional patterns. A common, though by no means uniform pattern, was to give a twenty-five to thirty minute large group presentation followed by independent inquiry or a small group discussion period of approximately one hour. The rearrangement of time patterns could not be done by the teachers of the autonomous school because they were scheduled into individual periods and the timetable was not changeable except through special arrangement with the principal. Variations in the instructional pattern also occurred in the autonomous classes but within a more limited range than in the team mode.

During the course of the three years it was found that there was a great deal of fluctuation in the percentages of total time given

to large group, seminar, and independent inquiry. This variation occurred from week to week as well as from one subject to the other.

A survey of the proportion of time being used for different purposes at about the half-way point in the project is reproduced here for information.

TABLE III

DISTRIBUTION OF TIME BY TEAMS, GRADES, AND ACTIVITIES SEPTEMBER-JANUARY 1964-65

Activity	TEAMS				
	Grade X		Grade XI		Grade XII
	English	Social Studies	English	Social Studies	English
Lectures	10%	42%	25%	36%	30%
Seminars	75%	26%	55%	32%	55%
Independent	15%	32%	20%	32%	15%

The autonomous teachers rarely brought large groups together because it was too difficult to arrange.

Seminars. The basic criterion for assigning students to seminars was past achievement in the subject, with similar achievers being placed together. However, particularly in the second and third year of the project, there was considerable emphasis on personality factors in

placing students in seminars which would provide the individuals with the greatest opportunity to develop. Thus in the team school the personal opinions of the team members determined the grouping of students whereas in the control school the placement of students into groups was an administrative responsibility.

Teachers in the team school remained with the same basic seminar group for the full year but changes in students were made when it seemed appropriate for a student to move to a more or less advanced group or to a more or less independent group. Once again this type of movement between groups was unique to the team school. In the control school students rarely if ever moved from one classroom group to another after classes were finally established early in the fall term.

In most cases each team teacher was responsible for two seminar groups which meant that student leaders took charge of discussion, the groups became involved in independent inquiry, or both groups came together for activities such as re-teaching, checking work, or inter-seminar presentations by students.

Large group instruction. Large group sessions involved all the students of one grade. Any one of the team members or a guest might give the lecture or on occasion, a group might make the presentation. During the course of the project certain team members became identified as experts in specific areas and they prepared and presented the lecture. The length of the presentation rarely exceed-

ed thirty minutes although each team developed its own approach to the length, content, and presentation of lectures.

The preparation of work by one teacher for all classes, within-subject specialization of teachers, and group presentations were not used by the autonomous teachers and were not looked upon as feasible activities in the control school.

Independent inquiry. The policy adopted in the areas of independent inquiry was that the degree of independence must be worked out between the student and his seminar teacher. It was expected that a continuum would extend from students who were almost totally teacher-directed to students who were almost totally self-directed. The teams assumed at the outset that it would take some time before both teachers and students would be able to take full advantage of this phase of the program. By the end of the third year there were still not more than 10 per cent of the students who were at the "student-directed" end of the continuum. On the other hand the team teacher had accepted the desirability to have students move away from the "teacher-directed" end and therefore some movement had taken place along the continuum.

In the control school one teacher only had taken some tentative steps toward encouraging independent study. Indications were that these students were at about the middle of the continuum.

General observations. One difference between the two modes which was clearly demonstrated was the freedom that stu-

dents having difficulty felt about going for help to any member of a team. Such an interaction between student and teacher could not easily occur in the autonomous situation or the teacher receiving the student would be looked upon as unprofessional.

The planning of teacher and student activities was probably the most obvious area of difference between the two modes. Both groups of teachers tended to have meetings early in the year to prepare a rough schedule of work to be covered. Beyond that point the similarities ceased. It was most unusual for teachers of the autonomous group to plan together after that initial stage. On the other hand the teams met on a regular basis, usually at noon hours two days each week. There was not an identifiable routine but the following description of a planning session might be typical:

> A member (the drama expert) of the English team outlined his proposal for a large group presentation and other activities in Grade XI Drama for the next week. One or two of the team members made suggestions about the presentation and requested a clarification of his objectives. Others asked him what activities he had in mind for seminar groups and upon hearing his proposals suggested a number of variations that they would probably make for their own groups. Some time was spent discussing the different directions students were taking on a major assignment in drama. The last five minutes of the meeting were taken up discussing the suggestion of a teacher that one of the major sections of poetry seemed to have left a large number of students confused and that perhaps the students should be re-grouped so that the one group might have a few review sessions. The decision was deferred to the next meeting. (Downie, 1965)

II. ASSUMPTIONS AND DELIMITATIONS

In examining differences in effects on behavioral outcomes,

the problem of identifying all of the variables was recognized as being extremely complex and therefore in planning the study, only those variables considered to be most significant were included for study.

As indicated in Section II of Chapter I, the dependent variables of achievement, responsibility, interest in subject matter, and teacher perceptions were selected as those suitable for research within the scope of this project. The independent variables which might have significant influences on the results of the experiment were examined and certain assumptions made with respect to them.

Assumptions

1. Teachers of the control and experimental schools were equally competent. The reports on all teachers in the control school indicated above average competence. The same situation was true of the experimental school with the exception of one teacher rated below average. This person left teaching at the end of the third year of the project. Data summarized in Appendix A, Table I, provides additional evidence concerning the validity of the assumption.

2. Equipment and supplies were equally available to the two schools. This was an operational policy of the division school board.

3. The size of the school populations did not differentially affect the experimental and control groups. Data is displayed in Appendix A, Table II.

4. The pupil/teacher ratio did not significantly affect be-

havioral outcomes. Data is displayed in Appendix A, Table III.

5. The nature of the total school program did not differentially affect the experimental and control groups.

Delimitations

1. No attention was given to a comparison of costs.

2. The compatability of teachers and their willingness to innovate were not examined.

3. The personality of students was not considered.

4. Only representative factors from Ryans' "Theory of Instruction" were examined.

5. Organizational climate was not examined.

6. Social Studies XII was not included because only about thirty students in each school elected that program.

III. RESEARCH HYPOTHESES

The decision about which dependent variables to examine in the project was discussed in Chapter I but although these naturally led to certain general hypotheses which have been listed, the refinement of these into specific research hypotheses and the selection of sub-groups requires some attention here.

The frequently expressed concern of local educators that the team mode was suitable only for high ability students made it important to use intelligence sub-groups. The suggestion that one

sex might respond more readily than the other to a basic change in teaching techniques led to a decision to use sex sub-groups as well.

For all criterion measures between modes therefore, both sex and intelligence sub-groups were compared. Since achievement was a concern of all the studies reported it was felt desirable to examine thoroughly this variable and therefore, the achievement of the sub-groups was compared within modes as well as between the two modes.

In the areas of responsibility and school subject rating a great number of possible combinations for investigation were available and therefore, to keep the study within some manageable proportions, only those areas which were appropriate and significant were used for sub-groups. The following considerations explain the selection of sub-groups for the various tests within modes.

1. The level of responsibility which a student accepts might be expected to affect his achievement, therefore high and low sub-groups of the You Sort score were used.

2. The level of responsibility which a student believes his teacher wishes him to accept may affect his achievement, therefore high and low sub-groups of the Teacher Sort scores were used.

3. The degree of congruence of the two previously mentioned responsibility patterns may affect achievement and interest in school subjects, therefore the high and low You/Teacher ratio sub-groups were used.

During the initial planning of the design for this research, the concern was expressed that it might be possible to obtain significant differences between schools which would be of no real significance if, in fact the general level of achievement had risen or fallen in one of the schools. To provide a check on this eventuality a combined mark of the other core subjects (mathematics and science) was introduced into the test pattern and examined in terms of achievement both between modes and in relation to responsibility level within each mode.

The research hypotheses for the general teacher perception hypothesis follow the three classes of inputs selected from Ryans' theory. For convenience, the research hypotheses are listed in the same grouping used to display the data and provide interpretations.

A. Achievement

This section contains hypotheses concerning total group differences in achievement between modes, sex and intelligence sub-groups between modes and sex and intelligence sub-groups within each mode. The check on mathematics and science achievement is also included.

1. Total Groups Between Team and Autonomous

   a. Social Studies, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in Social Studies are not significantly different between the autonomous mode and the team mode.

   b. English, Grade XI. The adjusted means of the scores on the Grade XI Departmental examinations in English are not significantly different between the autonomous mode and the team mode.

c. English, Grade XII. The adjusted means of the scores on the Grade XII Departmental examination in English are not significantly different between the autonomous mode and the team mode.

d. Mathematics-Science, Grade XI. The adjusted means of the combined scores on the Grade XI Departmental examinations in Mathematics and Science are not significantly different between the autonomous mode and the team mode.

e. Mathematics-Science, Grade XII. The adjusted means of the combined scores of Mathematics and Science on Grade XII Departmental examinations are not significantly different between the autonomous mode and the team mode.

2. Sex Sub-Groups Between Team and Autonomous

a. Social Studies XI. The adjusted means of the scores on the Grade XI Departmental examination in Social Studies are not significantly different between the corresponding sex sub-groups of the autonomous mode and the team mode.

b. English, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in English are not significantly different between the corresponding sex sub-groups of the autonomous mode and the team mode.

c. English, Grade XII. The adjusted means of the scores on the Grade XII Departmental examination in English are not significantly different between the corresponding sex sub-groups of the autonomous mode and the team mode.

3. Sex Sub-Groups Within the Team Mode.

a. Social Studies, Grade XI. The adjusted means of the scores on the Grade XI Social Studies Departmental examination are not significantly different between the sex sub-groups.

b. English, Grade XI. The adjusted means of the scores on the Grade XI English Departmental examination are not significantly different between the sex sub-groups.

c. English, Grade XII. The adjusted means of the scores on the Grade XII English Departmental examination are not significantly different between the sex sub-groups.

4. Intelligence Sub-Groups Between Modes

   a. Social Studies XI. The adjusted means of the scores on the Grade XI Departmental examination in Social Studies are not significantly different between the corresponding intelligence sub-groups of the autonomous mode and the team mode.

   b. English, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in English are not significantly different between the corresponding intelligence sub-groups of the autonomous mode and the team mode.

   c. English, Grade XII. The adjusted means of the scores on the Grade XII Departmental examination in English are not significantly different between the corresponding intelligence sub-groups of the autonomous mode and the team mode.

5. Intelligence Sub-Groups Within the Team Mode

   a. Social Studies, Grade XI. The adjusted means of the scores on the Grade XI Social Studies Departmental examination are not significantly different between the intelligence sub-groups.

   b. English, Grade XI. The adjusted means of the scores on the Grade XI English Departmental examination are not significantly different between the intelligence sub-groups.

   c. English, Grade XII. The adjusted means of the scores on the Grade XII English Departmental examination are not significantly different between the intelligence sub-groups.

B. Responsibility

Included in this section are hypotheses covering between-mode tests of You Sort and Teacher Sort scores, with both sex and intelligence sub-groups for the You Sort. For each mode there are a set of hypotheses examining achievement through sub-groups of You Sort, Teacher Sort and You/Teacher ratio. The mathematics-science check hypothesis is also included in this section.

1. Groups Between Team and Autonomous Modes

   a. You Sort. The adjusted means of the scores on the You Sort of the Q-Sorts instrument are not significantly different between the team mode and the autonomous mode.

   b. Sex Sub-Groups. The adjusted means of the scores on the You Sort are not significantly different for the sex sub-groups.

   c. Intelligence Sub-Groups. The adjusted means of the scores on the You Sort are not significantly different for the corresponding intelligence sub-groups.

   d. Social Studies Teacher Sort. The adjusted means of the scores on the Social Studies Teacher Sort of the Q-Sorts instrument are not significantly different between the team mode and the autonomous mode.

   e. English Teacher Sort. The adjusted means of the scores on the English Teacher Sort of the Q-Sorts instrument are not significantly different between the team mode and the autonomous mode.

2. Sub-Groups Within the Team Mode

   a. You Sort and Achievement

      (1) Social Studies, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in Social Studies are not significantly different between the higher score sub-group and the lower score sub-group of the You Sort.

      (2) English, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in English are not significantly different between the higher score sub-group and the lower score sub-group of the You Sort.

      (3) Mathematics-Science, Grade XI. The adjusted means of the combined scores of the Mathematics and Science Grade XI Departmental examinations are not significantly different between the higher score sub-group and the lower score sub-group of the You Sort.

(4) English, Grade XII. The adjusted means of the scores on the Grade XII Departmental examination in English are not significantly different between the higher score sub-group and the lower score sub-group of the You Sort.

(5) Mathematics-Science, Grade XII. The adjusted means of the combined scores of the Mathematics and Science Grade XII Departmental examinations are not significantly different between the higher score sub-group and the lower score sub-group of the You Sort.

b. Teacher Sort and Achievement

(1) Social Studies, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in Social Studies are not significantly different between the high and the low sub-groups of the Social Studies Teacher Sort.

(2) English, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in English are not significantly different between the high and the low sub-groups of the English Teacher Sort.

(3) English, Grade XII. The adjusted means of the scores on the Grade XII Departmental examination in English are not significantly different between the high and the low sub-groups of the English Teacher Sort.

c. You/Teacher Ratio and Achievement

(1) Social Studies, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in Social Studies are not significantly different between the high and the low You/Teacher SS ratio sub-groups.

(2) English, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in English are not significantly different between the high and the low You/Teacher E ratio sub-groups.

(3) English, Grade XII. The adjusted means of the scores on the Grade XII Departmental examination in English are not significantly different between the high and the low You/Teacher ratio sub-groups.

3. Sub-Groups Within the Autonomous Mode

a. You Sort and Achievement

(1) Social Studies, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in Social Studies are not significantly different between the higher score sub-group and the lower score sub-group of the You Sort.

(2) English, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in English are not significantly different between the higher score sub-group and the lower score sub-group of the You Sort.

(3) Mathematics-Science, Grade XI. The adjusted means of the combined scores of the Mathematics and Science Grade XI Departmental examinations are not significantly different between the higher score sub-group and the lower score sub-group of the You Sort.

(4) English, Grade XII. The adjusted means of the scores on the Grade XII Departmental examination in English are not significantly different between the higher score sub-group and the lower score sub-group of the You Sort.

(5) Mathematics-Science, Grade XII. The adjusted means of the combined scores of the Mathematics and Science Grade XII Departmental examinations are not significantly different between the higher score sub-group and the lower score sub-group of the You Sort.

b. Teacher Sort and Achievement

(1) Social Studies, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in Social Studies are not significantly different between the high and the low sub-groups of the Social Studies Teacher Sort.

(2) English, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in English are not significantly different between the high and the low sub-groups of the English Teacher Sort.

(3) English, Grade XII. The adjusted means of the scores on the Grade XII Departmental examination in English are not significantly different between the high and the low

sub-groups of the English Teacher Sort.

c. You/Teacher Ratio and Achievement

(1) Social Studies, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in Social Studies are not significantly different between the high and the low You/Teacher SS ratio sub-groups.

(2) English, Grade XI. The adjusted means of the scores on the Grade XI Departmental examination in English are not significantly different between the high and the low You/Teacher E ratio sub-groups.

(3) English, Grade XII. The adjusted means of the scores on the Grade XII Departmental examination in English are not significantly different between the high and the low You/Teacher E ratio sub-groups.

4. Teacher Sorts Within Modes

a. Teacher Sorts Within the Team Mode

Teacher Sort. The adjusted means of the scores on the Teacher Sort of the Q-Sorts instrument are not significantly different between the English Sort and the Social Studies Sort.

b. Teacher Sorts Within the Autonomous Mode

Teacher Sort. The adjusted means of the scores on the Teacher Sort of the Q-Sorts instrument are not significantly different between the English Sort and the Social Studies Sort.

C. School Subject Rating

This section contains hypotheses covering the total groups between modes as well as the sex and intelligence sub-groups between modes. Within each mode, hypotheses deal with subject rating scores compared through the You/Teacher ratio sub-groups. Subject ratings for three core subjects are compared within each mode.

1. Total Groups Between Team and Autonomous Modes

   a. Social Studies, Grade XI. The adjusted means of the Grade XI Social Studies rating are not significantly different between the team mode and the autonomous mode.

   b. English, Grade XI. The adjusted means of the Grade XI English rating are not significantly different between the team mode and the autonomous mode.

   c. English, Grade XII. The adjusted means of the Grade XII English rating are not significantly different between the team mode and the autonomous mode.

2. Sex Sub-Groups Between Team and Autonomous Modes

   a. Social Studies, Grade XI. The adjusted means of the Grade XI Social Studies rating are not significantly different for the sex sub-groups.

   b. English, Grade XI. The adjusted means of the Grade XI English rating are not significantly different for the sex sub-groups.

   c. English, Grade XII. The adjusted means of the Grade XII English rating are not significantly different for the sex sub-groups.

3. Intelligence Sub-Groups Between Modes

   a. Social Studies, Grade XI. The adjusted means of the Grade XI Social Studies rating are not significantly different for the corresponding intelligence sub-groups.

   b. English, Grade XI. The adjusted means of the Grade XI English rating are not significantly different for the corresponding intelligence sub-groups.

   c. English, Grade XII. The adjusted means of the Grade XII English rating are not significantly different for the corresponding intelligence sub-groups.

4. You/Teacher Ratio Sub-Groups Within the Team

   a. Social Studies, Grade XI. The adjusted means of Grade XI Social Studies scores on the Student Opinion Survey Instrument are not significantly different between the high and the low You/Teacher SS ratio sub-groups.

b. English, Grade XI. The adjusted means of the Grade XI English scores on the Student Opinion Survey instrument are not significantly different between the high and the low You/Teacher E ratio sub-groups.

c. English, Grade XII. The adjusted means of the Grade XII English scores on the Student Opinion Survey instrument are not significantly different between the high and the low You/Teacher E ratio sub-groups.

5. You/Teacher Ratio Sub-Groups Within the Autonomous Mode

a. Social Studies, Grade XI. The adjusted means of the Grade XI Social Studies scores on the Student Opinion Survey instrument are not significantly different between the high and the low You/Teacher SS ratio sub-groups.

b. English, Grade XI. The adjusted means of the Grade XI English scores on the Student Opinion Survey instrument are not significantly different between the high and the low You/Teacher E ratio sub-groups.

c. English, Grade XII. The adjusted means of the Grade XII English scores on the Student Opinion Survey instrument are not significantly different between the high and the low You/Teacher E ratio sub-groups.

6. Subject Ratings Within Modes

a. Subject Ratings Within the Team Mode. The adjusted means of the subject ratings are not significantly different between Grade XII English, Mathematics, and Science.

b. Subject Ratings Within the Autonomous Mode. The adjusted means of the subject ratings are not significantly different between the Grade XII English, Mathematics, and Science.

D. Teacher Perceptions

Hypotheses were raised to focus on whether among the three groups of teachers (autonomous teachers from the control school, autonomous teachers from the experimental school, and team teachers

from the experimental school) there were different perceptions about the external inputs, the feedback inputs, and the internal capabilities.

1. The means of the external input sub-scores on the Teacher Perception Scale are not significantly different among the three groups of teachers.

2. The means of the feedback input sub-scores on the Teacher Perception Scale are not significantly different among the three groups of teachers.

3. The means of the internal capabilities sub-scores on the Teacher Perception Scale are not significantly different among the three groups of teachers.

E. Student Preference

1. The students of the experimental school will show no preference between the team mode and the autonomous mode.

IV. COLLECTION AND TREATMENT OF DATA

Instruments and Their Administration

Grade IX Departmental examinations. These examinations were administered to all grade nine students in June, 1963. The examinations were externally set and externally marked.

Grade XI Departmental examinations: These examinations were externally set and internally marked. The marking was done according to a key provided by the external examination authority. These

examinations were administered to all grade eleven students of the control and experimental schools in June, 1965.

It should be noted that the Department of Education required that all answer papers be held in the school until the inspector had examined them. This was done and in October, 1965 the Department of Education inspector reported that both schools had followed the keys provided and that in fact the papers had been uniformly marked over the two schools.

Grade XII Departmental examinations. These examinations were externally set and externally marked under the direction of the Manitoba Department of Education. They were administered to all grade twelve pupils of the control and experimental schools in June, 1966.

Intelligence tests. The Otis group tests were administered in June, 1963 to all grade nine pupils who in September, 1963 registered in grade ten at the control and experimental schools.

Q-Sorts instrument. This instrument was developed at the University of Chicago in 1961 for use in a research project in two Illinois communities. (Fritz, 1963) It was designed to measure the degree to which pupils accept responsibility and to indicate this trait over an eighty-four point range of scores.

In the administration of the instrument pupils are presented with a group of tasks and asked to indicate whose responsibility it is to perform each task. In scoring, the assumption is made that when

a pupil indicates that he believes he should perform the task, he is demonstrating a higher level of responsibility than if he believes that his teacher should perform the task. The fact that in the normal course of events it might be quite inappropriate for a student to accept certain responsibilities does not in any way subtract from the total score which indicates a level of responsibility which the pupil is prepared to accept.

Since one of the stated objectives of each of the schools in the project was to develop student responsibility, the Q-Sorts instrument was selected as one of the criteria measures. The Q-Sorts instrument was administered as a pre-test in October, 1963, to all students in the control and experimental groups. It was administered again as a post-test in May, 1966, to the same students.

Student Opinion Survey instrument. This instrument was developed by Thelen (1961) and expanded by Fritz (1963). It was designed to measure student rating of school subjects and produces a total score for each subject which may range from 0 to 190 points.

In probing student interest in school subjects, the developers of the Student Opinion Survey instrument examined such factors as the degree to which the school subject was enjoyable, demanding or relevant to individual needs; the extent to which the student group was cooperative and friendly; the amount of assistance provided by the teacher and the fairness of his evaluation.

Since interest in the subject is a specific objective in English

and is a critical element in the development of an on-going desire to learn, the S.O.S. instrument was selected as a criterion measure. This instrument was administered to all pupils at the same times as the Q-Sorts.

Pupil questionnaire. This instrument was prepared for the study and was designed to lead students through a series of questions in which they compared the effectiveness of the team mode to the autonomous mode. Students were required to make a final decision concerning the desirability of the team mode as compared with the autonomous mode. The questionnaire was administered to the grade twelve students of the experimental school during May, 1966.

These students had experienced team teaching in English for their three high school years and social studies for two years. The same students had experienced autonomous teaching in all of their other subjects. Students who selected social studies in grade twelve represented only a small group and therefore were the responsibility of one of the social studies team members.

Teacher Perception scale. This instrument was prepared for the study and was designed to provide an indication of how teachers perceived various external and internal factors as affecting their teaching situation. The scale permitted a total score of 224 points with sub-scores for each of the inputs to be tested.

A panel of experts examined the items for validity and a pilot study was used to establish the reliability ($r = .72$ on a

repeated measure). The instrument was administered in May, 1966 to all teachers in the experimental school and to the teachers of English and social studies in the control school.

Determining the Sub-Groups

Sex sub-group. The control and experimental groups were broken into two sub-groups, each on the basis of sex.

Intelligence sub-groups. The control and experimental groups were broken into two sub-groups, each on the basis of intelligence. The intelligence quotient scores from the Otis Mental Ability test which was administered to all students in June of their grade nine year were used to rank the students in each school. The 50th percentile marked the division into higher and lower intelligence sub-groups.

It should be realized that since the students in the groups finally used in the analyses had completed three years of high school, the mean of the "lower" intelligence group actually was approximately the same as that of the general population.

Q-Sorts, You sub-groups. The pupils in each school were ranked on the basis of total scores on the final You Sort of the Q-Sorts instrument. The 50th percentile marked the division into higher and lower sub-groups.

Q-Sorts, Pupil/Teacher ratio. Those students whose ratio of You Sort score to Teacher Sort score was one or greater than one were placed in the high group. Those students whose

ratio of You Sort score to Teacher Sort score was less than one were placed in the low group.

The following table summarizes the break-down of sub-groups.

TABLE IV

NUMBER OF STUDENTS IN COMPARISON GROUPS

Group	Team	Autonomous
Total at start of the three-year project	115	102
Total to complete all tests over the full period and therefore the total group for analyses	70	53
Sex: Female	38	26
Male	32	27
Intelligence: Hi	38	26
Lo	32	27
You Sorts: Hi	37	26
Lo	33	27
Teacher S: Hi	36	27
Lo	34	26
Teacher E: Hi	35	26
Lo	35	27

Statistical Procedures

For purposes of testing, each of the research hypotheses is re-stated in operational form. Although the theory and much of the research indicate that there may be valid reasons for stating the hypotheses in directional form, the existence of the possibility of significant differences in either direction requires a two-tailed test situation. Therefore the operational forms are of the order, H_o: $\mu_1 - \mu_2 = 0$ and H_1: $\mu_1 \neq \mu_2$.

Characteristics of the data. The Departmental examinations, the Q-Sorts, the Student Opinion Survey and the Teacher Perception Scale, provided data of varying characteristics but authorities such as Lindquist (1953) and studies such as that of Ginther and Shroyer (1962) using similar data, have led the writer to conclude that these data do not preclude the use of parametric statistics.

Since one of the objectives of this study was to provide an evaluation of team teaching over a broader range of criteria and through a much longer treatment period than other studies, it was desirable to apply the significance level used in all other reported studies; that is the .05 level. This should facilitate comparison of the findings of this study with those of other research. Wherever possible the actual probability has been given so that the reader may draw his own conclusions.

Achievement hypotheses. These hypotheses were tested by means of an analysis of covariance using achievement on the

grade eleven and grade twelve Departmental examinations as criterion variable and achievement on the grade nine Departmental examinations as the covariate. The parameter groups are the sex sub-groups, the intelligence sub-groups.

Responsibility hypotheses. These hypotheses were tested by means of an analysis of covariance using the May. 1966, scores on the Q-Sorts instrument as the criterion variable and the fall, 1963 scores on the Q-Sorts instrument as the covariate. The parameter groups are the appropriate sex, intelligence, and Q-Sorts sub-groups.

Subject rating. These hypotheses were tested by means of an analysis of covariance using the May, 1966 scores on the Student Opinion Survey as the criterion variate and the October, 1963 scores on the Student Opinion Survey as the covariate. The parameter groups are the appropriate sex, intelligence and Q-Sorts sub-groups.

Teacher perception. These hypotheses were tested by means of an analysis of variance. The analysis was carried out to determine if any differences existed among the three groups of teachers, using total score on the Teacher Perception Scale as the criterion. The Newman-Keuls test was then used to determine specific areas of significant difference. A similar analysis was done using each of the sub-scores of the Teacher Perception Scale as criteria.

Student preference. The data used here was based on the

Student Questionnaire and is purely descriptive. A summary shows the number of students favoring and opposing the teaching team mode.

CHAPTER IV

FINDINGS AND INTERPRETATIONS

The first four tables in this chapter provide preliminary information relating to all administrations of the major instruments used in the study. This will enable the reader to obtain a general view of the test scores and assist in the more specific interpretation of the data.

TABLE V

FREQUENCY DISTRIBUTION OF TEACHER PERCEPTION SCALE SCORES

Class Interval	Frequency External Inputs	Class Interval	Frequency Total Scores
91 - 100		181 - 190	1
81 - 90		171 - 180	2
71 - 80	8	161 - 170	4
61 - 70	16	151 - 160	5
51 - 60	10	141 - 150	7
41 - 50	3	131 - 140	7
31 - 40	1	121 - 130	7
21 - 30		111 - 120	4
11 - 20		101 - 110	0
1 - 10		91 - 100	1
N	38		38
Mean	62.5		141.1
S.D.	9.72		19.54
Median	63.6		140.4

TABLE VI

FREQUENCY DISTRIBUTION OF ACHIEVEMENT SCORES

	FREQUENCY								
	IX				XI			XII	
Class Interval	Eng.	Soc. St.	Math.	Sci.	Eng.	Soc. St.	Math. Sci.	Eng.	Math. Sci.
91 - 100		23	42	28		1	17		6
81 - 90	46	43	40	40	5	11	20	2	15
71 - 80	46	22	21	32	21	33	37	9	21
61 - 70	23	18	11	15	48	38	24	25	26
51 - 60	7	13	8	4	36	33	20	37	24
41 - 50	1	4	1	3	12	4	5	22	17
31 - 40				1	0	3		17	4
21 - 30					0			2	1
11 - 20					0				
1 - 10					1				
N	123	123	123	123	123	123	123	114	114
Mean	76.4	78.6	83.1	80.3	62.3	66.2	74.1	54.3	64.5
S.D.	8.9	13.6	12.3	12.6	10.4	11.0	17.7	12.5	15.1
Median	78.0	82.0	85.0	82.0	62.0	68.0	74.0	55.5	63.5

TABLE VII

FREQUENCY DISTRIBUTION OF Q-SORT SCORES

	FREQUENCY							
	Pre-Test			XI			XII	
Class Interval	You Sort	T.E. Sort	T.S.S. Sort	You Sort	T.E. Sort	T.S.S. Sort	You Sort	T.E. Sort
96 - 100		1	1	1		2	1	4
91 - 95	1	3	6	8	5	5	7	11
86 - 90	9	9	15	16	24	12	10	18
81 - 85	21	23	26	24	30	20	23	23
76 - 80	47	36	36	31	22	33	41	26
71 - 75	39	35	32	27	29	31	27	21
66 - 70	6	10	6	13	12	13	10	12
61 - 65		6	1	3	1	7	4	6
56 - 60								2
N	123	123	123	123	123	123	123	123
Mean	77.8	77.2	79.3	78.8	79.5	77.3	78.4	80.0
S.D.	5.0	6.7	6.6	7.3	7.1	7.6	6.9	8.9
Median	78.0	77.0	79.0	79.0	80.0	77.0	78.0	80.0

TABLE VIII

FREQUENCY DISTRIBUTION OF STUDENT OPINION SURVEY SCORES

	FREQUENCY							
	Pre-Test				Post Test			
Class Intervals	Eng.	Soc. St.	Sci.	Math.	Eng. XII	Soc. St. XI	Sci. XII	Math XII
181 - 190	2					1		3
171 - 180	6	5	4	2	1	0	1	0
161 - 170	12	9	9	6	7	4	7	1
151 - 160	13	10	11	9	9	8	10	9
141 - 150	11	9	15	17	13	11	15	12
131 - 140	15	9	14	25	12	7	16	14
121 - 130	12	13	17	18	14	12	18	9
111 - 120	13	12	10	9	8	14	12	13
101 - 110	8	15	10	12	8	14	17	7
91 - 100	5	13	11	11	11	10	8	14
81 - 90	14	12	4	4	9	13	6	12
71 - 80	9	6	10	2	8	9	3	8
61 - 70	2	8	2	2	10	8	6	10
51 - 60	1	1	4	5	5	4	2	7
41 - 50		1	0	1	5	5	0	4
31 - 40			1		2	1	1	
21 - 30			0		0	2	0	
11 - 20			1		1		1	
1 - 10								
N	123	123	123	123	123	123	123	123
Mean	125.1	117.1	120.7	123.0	109.2	106.1	120.0	108.4
S.D.	31.5	31.9	32.5	27.9	37.0	34.7	30.8	34.8
Median	127.0	114.0	126.0	127.0	113.0	108.0	124.0	110.0

A. Achievement (Tables IX - XIII)

1. Comparison of Achievement for Total Groups Between Team and Autonomous Modes

Within the general area of achievement (Table IX) hypothesis 1 (a) (Social Studies) was not rejected; hypotheses 1 (b) and 1 (c) were rejected with significant differences for English XI in favor of the team mode and for English XII in favor of the autonomous mode. For the mathematics-science check groups, hypotheses 1 (d) and 1 (e) were not rejected although Mathematics-Science XII approached significance at the .056 level with the difference in favor of the autonomous mode.

TABLE IX

COMPARISON OF ACHIEVEMENT FOR TOTAL GROUPS BETWEEN TEAM AND AUTONOMOUS MODES

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
1 a	SS XI - Auto	67.7	65.2	1.315	.254
	SS XI - Team	65.5	67.3		
1 b	Eng XI - Auto	58.2	58.6	10.7	.001
	Eng XI - Team	64.7	64.4		
1 c	Eng XII - Auto	57.2	57.0	5.97	.016
	Eng XII - Team	51.3	51.4		
1 d	Math-Sci XI - Auto	168.5	168.0	.531	.467
	Math-Sci XI - Team	151.4	151.9		
1 e	Math-Sci XII - Auto	85.8	86.1	3.72	.056
	Math-Sci XII - Team	83.1	82.9		

Note - Mathematics and science were not team taught and therefore, in 1 (d) and 1 (e) the terms "autonomous" and "team" refer to control and experimental groups respectively.

2. Comparison of Achievement for Sex Sub-Groups Between Team and Autonomous Modes

Still in the area of achievement (Table X) but with respect to the sex sub-groups, hypothesis 2(a) (Social Studies XI) was not rejected; hypothesis 2 (b) was not rejected with respect to males but for females, it was rejected with a difference in English XI significantly in favor of the team mode. Hypothesis 2 (c) was not rejected with respect to females but was rejected for males with a difference in English XII significantly in favor of the autonomous mode.

TABLE X

COMPARISON OF ACHIEVEMENT FOR SEX SUB-GROUPS BETWEEN TEAM AND AUTONOMOUS MODES

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
2 a	SS XI - Auto M	65.0	63.7	.622	.434
	SS XI - Team M	64.4	65.4		
2 a	SS XI - Auto F	70.5	66.6	.649	.424
	SS XI - Team F	66.4	69.0		
2 b	Eng XI - Auto M	58.1	59.0	.946	.335
	Eng XI - Team M	61.8	61.1		
2 b	Eng XI - Auto F	58.2	58.0	11.65	.001
	Eng XI - Team F	67.1	67.3		
2 c	Eng XII - Auto M	54.0	54.5	4.75	.034
	Eng XII - Team M	48.2	47.8		
2 c	Eng XII - Auto F	60.2	59.7	1.62	.209
	Eng XII - Team F	55.8	56.2		

3. Comparison of Achievement for Sex Sub-Groups Within the Team Mode

Considering achievement within the team mode and in the context of the sex sub-groups (Table XI) hypothesis 3 (a) (Social Studies XI) was not rejected. Hypotheses 3 (b) (English XI) and 3 (c) (English XII) were both rejected with differences significantly favoring the females.

TABLE XI

COMPARISON OF ACHIEVEMENT FOR SEX SUB-GROUPS WITHIN THE TEAM MODE

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
3 a	SS XI - Team M	64.4	63.8	2.38	.128
	SS XI - Team F	66.4	66.9		
3 b	Eng XI - Team M	61.8	62.1	7.66	.007
	Eng XI - Team F	67.1	66.9		
3 c	Eng XII - Team M	48.2	48.3	8.41	.005
	Eng XII - Team F	55.8	55.7		

4. Comparison of Achievement for Intelligence Sub-Groups Between Modes

Within the intelligence sub-groups (Table XII) the only hypothesis rejected was 4 (b) with respect to the lower intelligence group for English XI. For this hypothesis the difference significantly favor-

ed the team mode. Hypotheses 4 (a) and 4 (c) were not rejected for either intelligence level, nor was hypothesis 4 (b) with respect to the high intelligence sub-group.

TABLE XII

COMPARISON OF ACHIEVEMENT FOR INTELLIGENCE SUB-GROUPS BETWEEN MODES

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
4 a	SS XI - Auto Hi IQ	69.3	68.3	.636	.428
	SS XI - Team Hi IQ	69.3	70.0		
4 a	SS XI - Auto Lo IQ	66.1	62.0	.532	.469
	SS XI - Team Lo IQ	61.0	64.4		
4 b	Eng XI - Auto Hi IQ	62.0	62.9	2.63	.110
	Eng XI - Team Hi IQ	67.6	67.0		
4 b	Eng XI - Auto Lo IQ	54.5	54.4	7.80	.007
	Eng XI - Team Lo IQ	61.3	61.4		
4 c	Eng XII - Auto Hi IQ	61.0	61.8	3.30	.074
	Eng XII - Team Hi IQ	57.0	56.5		
4 c	Eng XII - Auto Lo IQ	53.1	52.4	3.56	.065
	Eng XII - Team Lo IQ	46.1	46.6		

5. Comparison of Achievement for Intelligence Sub-Groups Within the Team Mode

In the intelligence sub-groups within the team mode (Table

XIII) the only hypothesis rejected was 5 (c) which indicated a significant difference in achievement of English XII in favor of the high ability sub-group. Hypotheses 5 (a) (Social Studies XI) and 5 (b) (English XI) were not rejected.

TABLE XIII

COMPARISON OF ACHIEVEMENT FOR INTELLIGENCE SUB-GROUPS WITHIN THE TEAM

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
5 a	SS XI - Team Hi IQ	69.3	66.6	.994	.322
	SS XI - Team Lo IQ	61.0	64.2		
5 b	Eng XI - Team Hi IQ	67.6	65.4	.521	.473
	Eng XI - Team Lo IQ	61.3	63.9		
5 c	Eng XII - Team Hi IQ	57.0	55.2	4.72	.034
	Eng XII - Team Lo IQ	46.1	48.4		

SUMMARY AND INTERPRETATION OF "ACHIEVEMENT" FINDINGS

Total Group Findings

In the area of achievement one of the findings requiring explanation is the reversal of significant differences from one favoring the team in English XI to one favoring the autonomous mode in English XII (Table IX).

The English XII program is recognized in the province as a much more demanding program than the English XI and therefore, the

full competence of both students and teachers is called upon. In conventional schools it is common practice to place the most experienced teachers at the senior level where their previous close contacts in marking and setting departmental examinations will be of valuable assistance to grade twelve students in their preparation for these examinations. Such a practice was not possible in the team situation and therefore, the presence of one less competent teacher on the team may have been particularly critical for the grade twelve students. This explanation appears to be given support from the fact that when the teacher was replaced in September, 1966 and the team was raised to the level of competence of the autonomous group of teachers, the achievement of the students in English XII[1] in 1967 reached a level more in keeping with that of the English XI students in the experiment.

It is important to note that the group of students who wrote the grade twelve examinations in 1967 were not part of the experiment and therefore, the scores shown are unadjusted means. However, the students came from the same population as the students in the experiment and therefore it may be reasonable to as-

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[1]A COMPARISON OF ACHIEVEMENT IN ENGLISH XII, 1967

Source	Means	F	P Level
Eng XII Auto	53.65	2.43	.07
Eng XII Team	56.20		

sume that the pre-test scores would have been comparable.

A second area requiring explanation is the difference in results for English XI and Social Studies XI. Although all analyses of achievement scores in Social Studies XI tended to favor the team mode, there were no significant differences. Here the relative competencies in the team and autonomous groups of teachers were not in question and therefore some re-examination of the operation of the two treatments in social studies was necessary. According to Table III the social studies team used a higher percentage of lecture time and a lower percentage of seminar time than did the English team. Also, the one autonomous teacher who made use of discussion in class and had some approach to independent study, was a social studies teacher. An examination of samples of seminar topics for both English and social studies teams indicated a trend to more topics in social studies leading to the preparation of conventional notes than to the more "free-wheeling" discussion topics of the English seminars. The summation of these slight directional differences would seem to support a suggestion that the autonomous and team social studies teachers were more similar in their modes than were the two groups of English teachers. These factors may have resulted in the differences in achievement on the Social Studies XI Departmental examination being not significantly different between the two modes, whereas for English XI they were significantly different.

Sex sub-group findings. The fact that females under the team mode did better in English XI than did the females under the autonomous mode would seem to be contradicted by the "no significant difference" finding for English XII (Table X). The significant difference in achievement favoring the females over the males within the team mode is related to the problem and may be interpreted through the same general explanation.

The explanation given in the previous section involving team competence and course difficulty effectively accounts for the first part of this finding but to complete the interpretation of the second part requires the assumption that the English program is aligned more with female interests than with the interests of males, or perhaps that the expectations are higher for females than males and that these expectations tend to be fulfilled. If this assumption is correct, it may be explained that within the experimental school the more effective team mode made it possible for females to surpass the males in a subject which was more appropriate to their interests. This was strongly in evidence in both the grade eleven and grade twelve achievement in English (Table XI).

In social studies on the other hand, the absence of any real difference between the team and the autonomous teachers may explain the "no significant difference."

Intelligence sub-group findings. Between the team and autonomous modes the findings (Table XII) and therefore the interpreta-

tions, follow much the same pattern as for the total groups. However, special attention must be drawn to the lower ability group which appears to have obtained the greater benefit from the team approach. This finding is in contradiction to the predictions of several school officials who passed judgment on the program during the course of the experiment. Considering the emphasis of the teams on seminars and the selection of student members, the finding should not be unexpected, for the lower ability student should have felt freer to participate in discussion and test his own ideas than he would in the autonomous situation.

Within the experimental school, if the team mode was a particularly effective technique it would be expected that the higher ability students would show greater achievement gain than those of lower ability. This did happen in the case of English XII but did not happen in English XI and Social Studies XI (Table XIII). If the English XI course was less demanding than the English XII, it would be quite possible that the examination would not allow enough scope for the higher ability students to show distinct superiority in achievement.

A summary of the interpretations presented in the foregoing sections produces a general rationale for the overall understanding of the findings relating to student achievement under the two teaching modes. The elements of the rationale may be summarized as follows:

1. Team teaching tended to provide a more effective mode for the learning process.

2. The social studies team and the autonomous social studies teachers tended toward more similar methods than did the two English teachers groups.

3. The English team was less competent than the autonomous teachers of English XII and approximately equal in competence to the autonomous teachers of English XI.

4. The English XII program was more demanding of students and teachers than was the English XI program.

5. The English program was more closely aligned to the interests of girls than to the interests of boys.

B. Responsibility (Tables XIV - XX)

1. Comparison of Responsibility Scores Between Team and Autonomous Modes

In the general area of responsiblity levels between the team and autonomous modes (Table XIV) the only hypothesis rejected was 1 (c) with respect to the You Sort scores for the lower intelligence subgroup. The difference in willingness to accept responsiblity was significantly in favor of the team group. Hypotheses 1 (a) (total You Sort), 1 (b) (male and female You Sort), 1 (c) (high intelligence You Sort), 1 (d) (social studies Teacher Sort), and 1 (e) (English Teacher Sort) were not rejected.

TABLE XIV

COMPARISON OF RESPONSIBILITY SCORES BETWEEN TEAM AND AUTONOMOUS STUDENTS

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
1 a	You - Auto	77.8	78.2	.231	.632
	You - Team	79.3	78.9		
1 b	You - Auto M	76.6	76.9	.689	.410
	You - Team M	78.8	78.6		
1 b	You - Auto F	79.0	79.6	.031	.861
	You - Team F	79.6	79.2		
1 c	You - Auto Hi IQ	81.2	81.6	1.52	.223
	You - Team Hi IQ	79.4	79.1		
1 c	You - Auto Lo IQ	74.4	74.8	5.21	.026
	You - Team Lo IQ	79.1	78.7		
1 d	TSS - Auto	76.5	76.3	.379	.539
	TSS - Team	77.1	77.3		
1 e	TE - Auto	80.1	80.2	.313	.577
	TE - Team	79.4	79.3		

2. Comparison of Achievement Within the Team Mode Using Responsibility Score Sub-Groups

a. Comparison of achievement of high and low You Sort groups. In the consideration of the willingness to accept responsibility within the team mode, the high and low You Sort sub-groups

(Table XV) showed no significant differences in any of the achievement scores. Therefore none of the hypotheses 2 (a) (1 - 5) were rejected.

TABLE XV

COMPARISON OF ACHIEVEMENT OF HIGH AND LOW YOU SORT GROUPS WITHIN THE TEAM MODE

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
2 a (1)	SS XI - Team Hi You	68.3	66.8	1.78	.187
	SS XI - Team Lo You	62.3	63.9		
2 a (2)	Eng XI - Team Hi You	66.5	65.5	.815	.370
	Eng XI - Team Lo You	62.7	63.8		
2 a (3)	Math-Sc XI - Team Hi You	157.4	152.5	.190	.665
	Math-Sc XI - Team Lo You	144.8	150.3		
2 a (4)	Eng XII - Team Hi You	52.3	51.0	.716	.401
	Eng XII - Team Lo You	52.1	53.4		
2 a (5)	Math-Sc XII - Team Hi You	84.8	83.8	.397	.531
	Math-Sc XII - Team Lo You	81.5	82.5		

b. Comparison of achievement of high and low Teacher Sort groups. Using Teacher Sort sub-groups (Table XVI), hypotheses 2 b (1) (Social Studies XI) and 2 b (2) (English XI) were not rejected. Hypothesis 2 b (3) was rejected with a difference in achievement on

English XII significantly in favor of the low Teacher Sort sub-group.

TABLE XVI

COMPARISON OF ACHIEVEMENT OF HIGH AND LOW TEACHER SORT GROUPS WITHIN THE TEAM MODE

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
2 b (1)	SS XI - Team Hi TSS	66.4	65.6	.019	.892
	SS XI - Team Lo TSS	64.6	65.3		
2 b (2)	Eng XI - Team Hi TE	63.4	63.4	2.06	.156
	Eng XI - Team Lo TE	66.0	66.0		
2 b (3)	Eng XII - Team Hi TE	34.5	38.6	4.90	.031
	Eng XII - Team Lo TE	49.9	46.1		

c. Comparison of achievement of high and low You/Teacher ratio groups. In examining achievement of You/Teacher ratio sub-groups (Table XVII), no significant differences appeared, therefore none of hypotheses 2 c (1) (Social Studies XI), 2 c (2) (English XI) or 2 c (3) (English XII) were rejected.

TABLE XVII

COMPARISON OF ACHIEVEMENT OF HIGH AND LOW YOU/TEACHER RATIO GROUPS WITHIN THE TEAM MODE

Hypothesis	Sources	Means UNADJ	Means ADJ	F	P Level
2 c (1)	SS XI - Team Hi Y/TSS	66.2	66.1	.788	.378
	SS XI - Team Lo Y/TSS	64.0	64.1		
2 c (2)	Eng XI - Team Hi Y/TE	65.8	65.1	.183	.670
	Eng XI - Team Lo Y/TE	63.7	64.3		
2 c (3)	Eng XII - Team Hi Y/TE	50.1	50.0	2.33	.132
	Eng XII - Team LoY/TE	54.1	54.2		

3. Comparison of Achievement Within the Autonomous Mode Using Responsibility Score Sub-Groups

a. Comparison of achievement of high and low You Sort groups within the autonomous mode. As in the team mode the high and low You Sort sub-groups (Table XVIII) showed no significant differences in any of the achievement scores, therefore none of the hypotheses 3 a (1 - 5) were rejected.

TABLE XVII

COMPARISON OF ACHIEVEMENT OF HIGH AND LOW YOU SORT GROUPS WITHIN THE AUTONOMOUS MODE

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
3 a (1)	SS XI - Auto Hi You	65.8	65.0	3.26	.077
	SS XI - Auto Lo You	69.5	70.2		
3 a (2)	Eng XI - Auto Hi You	59.7	58.9	.162	.689
	Eng XI - Auto Lo You	56.8	57.5		
3 a (3)	Math-Sc XI - Auto Hi You	194.2	192.5	.807	.373
	Math-Sc XI - Auto Lo You	143.8	145.5		
3 a (4)	Eng XII - Auto Hi You	59.6	59.0	1.48	.230
	Eng XII - Auto Lo You	54.1	54.9		
3 a (5)	Math-Sc XII - Auto Hi You	85.3	83.7	2.86	.098
	Math-Sc XII - Auto Lo You	86.4	88.5		

b. Comparison of achievement of high and low Teacher Sort groups. Using the high and low Teacher Sort sub-groups (Table XIX) there were no significant differences of achievement for any of the school subjects, therefore none of the hypotheses 3 b (1), 3 b (2), or 3 b (3) were rejected.

TABLE XIX

COMPARISON OF ACHIEVEMENT OF HIGH AND LOW TEACHER SORT GROUPS WITHIN THE AUTONOMOUS MODE

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
3 b (1)	SS XI - Auto Hi TSS	70.1	69.1	1.02	.318
	SS XI - Auto Lo TSS	65.2	66.2		
3 b (2)	Eng XI - Auto Hi TE	60.2	59.7	.774	.383
	Eng XI - Auto Lo TE	56.2	56.7		
3 b (3)	Eng XII - Auto Hi TE	57.2	57.7	.0937	.761
	Eng XII - Auto Lo TE	57.2	56.6		

c. Comparison of achievement of high and low You/Teacher ratio groups. Again as in the team mode, no significant differences in achievement appeared when the scores were compared for the You/Teacher ratio sub-groups (Table XX), therefore none of the hypotheses 3 c (1), 3 c (2), or 3 c (3) were rejected.

TABLE XX

COMPARISON OF ACHIEVEMENT OF HIGH AND LOW YOU/TEACHER RATIO GROUPS WITHIN THE AUTONOMOUS MODE

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
3 c (1)	SS XI - Auto Hi Y/TS	66.4	66.5	.695	.408
	SS XI - Auto Lo Y/TS	69.1	69.0		
3 c (2)	Eng XI - Auto Hi Y/TE	59.8	60.2	1.25	.269
	Eng XI - Auto Lo Y/TE	56.8	56.5		
3 c (3)	Eng XII - Auto Hi Y/TE	59.3	57.1	.004	.948
	Eng XII - Auto Lo Y/TE	55.9	57.3		

SUMMARY AND INTERPRETATION OF "RESPONSIBILITY" FINDINGS

With the almost uniform "no significant difference" finding in this part of the study, it may be that the instrument was not sufficiently discriminating although the frequency distributions displayed in Table VII (page 74) would appear to discount that possibility. On the other hand, perhaps the Q-Sort instrument did not measure the qualities of responsibility being developed by the independent study aspect of the team program. Finally, the explanation may be simply that the treatments did not significantly affect that element of student behavior.

Such an explanation does not give attention to the acceptance of greater responsibility by the team lower ability group (Table XIV). It would seem likely that with the considerable increase in interest shown by the lower ability team students (Table XXIII), they have accepted a normal amount of responsibility whereas the lower ability students of the autonomous group having lost interest, have similarly lost a willingness to accept responsibility.

One further significant difference appeared in Table XVI which shows that within the team mode those students who scored low on the English Teacher Sort achieved significantly higher in English XII than did those students who scored high on the English Teacher Sort. To phrase it in a different way, those students within the team mode who looked upon the teacher as authoritarian and giving limited responsibility to students did significantly better on the English XII examination than did those pupils in the team mode who perceived the teacher as granting the students a large measure of responsibility. One possible explanation for this could be that the students of the former group were, themselves, willing to accept a large amount of responsibility and as a consequence were able to take up the slack from the relatively incompetent English team and do well on the examination.

C. Subject Rating (Tables XXI - XXVI)

1. Comparison of School Subject Ratings for Total Groups Between Team and Autonomous Modes

Within the area of subject rating between the two modes (Table XXI), hypotheses 1 (a) (Social Studies XI), and 1 (c) (English XI) were not rejected. Hypothesis 1 (c) was rejected with a significant difference in English XII rating in favor of the team mode.

TABLE XXI

COMPARISON OF SCHOOL SUBJECT RATINGS FOR TOTAL GROUPS BETWEEN TEAM AND AUTONOMOUS MODES

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
1 a	SS XI - Auto	95.9	99.2	3.60	.060
	SS XI - Team	113.7	111.2		
1 b	Eng XI - Auto	104.4	109.5	.155	.694
	Eng XI - Team	111.2	107.3		
1 c	Eng XII - Auto	93.7	97.5	11.303	.001
	Eng XII - Team	120.9	118.1		

2. Comparison of School Subject Ratings for Sex Sub-Groups Between Team and Autonomous Modes

In considering subject rating in relation to the sex sub-groups (Table XXII) the same pattern emerged as with the total groups. Hypotheses 2 (a) (Social Studies XI) and 2 (b) (English XI) were not

rejected. Hypothesis 2 (c) (English XII) was rejected with respect to both males and females. For both males and females the difference in English XII rating was significantly in favor of the team.

TABLE XXII

COMPARISON OF SCHOOL SUBJECT RATINGS FOR SEX SUB-GROUPS BETWEEN TEAM AND AUTONOMOUS MODES

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
2 a	SS XI - Auto M	93.6	96.7	1.39	.244
	SS XI - Team M	109.7	107.0		
2 a	SS XI - Auto F	98.4	101.1	2.38	.128
	SS XI - Team F	117.2	115.3		
2 b	Eng XI - Auto M	89.3	95.0	.225	.636
	Eng XI - Team M	103.5	98.8		
2 b	Eng XI - Auto F	120.1	123.0	.968	.329
	Eng XI - Team F	117.7	115.7		
2 c	Eng XII - Auto M	80.6	86.0	10.890	.002
	Eng XII - Team M	116.8	112.2		
2 c	Eng XII - Auto F	96.4	99.3	11.362	.001
	Eng XII - Team F	121.8	119.9		

3. Comparison of School Subject Ratings for Intelligence Sub-Groups Between Team and Autonomous Modes

Examining subject rating for the intelligence sub-groups

(Table XXIII) led to the rejection of hypotheses 3 (a) (Social Studies XI) and 3 (c) (English XII) for the lower ability students. The difference in Social Studies XI rating was significantly in favor of the lower ability team sub-group. The difference in English XII rating was also in favor of the lower ability team group. Hypothesis 3 (b) (English XI) was not rejected for either ability group nor were hypotheses 3 (a) and 3 (c) for the high ability groups.

TABLE XXIII

COMPARISON OF SCHOOL SUBJECT RATINGS FOR INTELLIGENCE SUB-GROUPS BETWEEN TEAM AND AUTONOMOUS MODES

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
3 a	SS XI - Auto Hi IQ	93.1	99.0	.0246	.876
	SS XI - Team Hi IQ	104.4	100.4		
3 a	SS XI - Auto Lo IQ	98.6	100.1	6.33	.015
	SS XI - Team Lo IQ	124.8	123.6		
3 b	Eng XI - Auto Hi IQ	104.5	109.3	1.78	.188
	Eng XI - Team Hi IQ	102.7	99.4		
3 b	Eng XI - Auto Lo IQ	104.3	109.6	.777	.382
	Eng XI - Team Lo IQ	121.4	117.0		
3 c	Eng XII - Auto Hi IQ	95.6	98.7	.488	.488
	Eng XII - Team Hi IQ	106.8	104.7		
3 c	Eng XII - Auto Lo IQ	91.9	95.7	22.68	.000
	Eng XII - Team Lo IQ	137.8	134.6		

4. Comparison of School Subject Ratings of High and Low You/Teacher Ratio Groups Within the Team Mode

Using the responsibility sub-groups of You/Teacher ratios (Table XXIV) as a base for considering subject rating, led to the rejection of hypothesis 4 (c) with a difference in English XII rating significantly in favor of the high You/Teacher ratio. Hypotheses 4 (a) (Social Studies XI) and 4 (b) (English XI) were not rejected.

TABLE XXIV

COMPARISON OF SCHOOL SUBJECT RATINGS OF HIGH AND LOW YOU/TEACHER RATIO GROUPS WITHIN THE TEAM MODE

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
4 a	SS XI - Team Hi Y/TSS	110.5	110.3	1.66	.202
	SS XI - Team Lo Y/TSS	120.8	121.1		
4 b	Eng XI - Team Hi Y/TE	116.4	114.0	.395	.532
	Eng XI - Team Lo Y/TE	106.8	108.9		
4 c	Eng XII - Team Hi Y/TE	129.7	131.0	6.614	.012
	Eng XII - Team Lo Y/TE	113.6	112.5		

5. Comparison of School Subject Ratings of High and Low You/Teacher Ratio Groups Within the Autonomous Mode

Within the autonomous mode there were no significant differences in subject rating when the high and low You/Teacher sub-groups

(Table XXV) were compared, therefore none of hypotheses 5 (a), (b), or (c) were rejected.

TABLE XXV

COMPARISON OF SCHOOL SUBJECT RATINGS OF HIGH AND LOW YOU/TEACHER RATIO GROUPS WITHIN THE AUTONOMOUS MODE

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
5 a	SS XI - Auto Hi Y/TSS	101.8	101.9	1.95	.169
	SS XI - Auto Lo Y/TSS	89.4	89.2		
5 b	Eng XI - Auto Hi Y/TE	102.9	102.3	.360	.551
	Eng XI - Auto Lo Y/TE	105.7	106.2		
5 c	Eng XII - Auto Hi Y/TE	91.7	94.2	.007	.933
	Eng XII - Auto Lo Y/TE	95.3	93.4		

6. Subject Ratings Within the Modes

A comparison of the ratings of the grade twelve subjects by the students in each mode (Table XXVI) indicated no significant differences in the team mode and therefore, hypothesis 6 (a) was not rejected. In the autonomous mode however, hypothesis 6 (b) was rejected with significant differences existing between English and science in favor of science and between mathematics and science, favoring science. There were no significant differences between mathematics and English.

TABLE XXVI

COMPARISON OF SCHOOL SUBJECT RATINGS WITHIN THE MODES

A. Analysis

Hypothesis	Source	Means UNADJ	Means ADJ	F	P Level
6 a	Eng XII - Team	120.9	120.5		
	Math XII - Team	121.8	122.4	.854	.427
	Sc XII - Team	116.1	115.9		
6 b	Eng XII - Auto	93.7	93.9		
	Math XII - Auto	90.7	90.7	17.325	.000
	Sc XII - Auto	125.1	125.0		

B. Newman-Keuls Comparison Between Ordered Means

Groups		2	1	3
	Means	90.657	93.873	124.998
2	90.657	--	n.s.	**
1	93.873		--	**
3	124.998			--

n.s. - not significant
** - significant at .01 level

Group 1 - Eng XII - Auto
Group 2 - Math XII - Auto
Group 3 - Sc XII - Auto

SUMMARY AND INTERPRETATION OF SCHOOL SUBJECT RATING FINDINGS

Examination of the data from the administration of the Student Opinion Survey instrument revealed that the scores of the team students were consistently higher than those of the autonomous students for the fall of 1963. This lead to the conclusion that although the October administration of the test had given students an opportunity to become familiar with their school subjects, it had also given them an opportunity to be caught up in the enthusiasm for the team mode. Unfortunately this may have tended to distort some of the adjusted means in favor of the autonomous mode and make a clear interpretation of the findings more difficult.

English XII was the most productive in showing results with the total group showing a difference significant at the .001 level (Table XXI) in favor of the team mode. Similarly in English XII, both male and female sub-groups showed differences significant at .002 and .001 respectively (Table XXII). Once again the lower intelligence sub-group of English XII showed a difference beyond the .001 level (Table XXIII) in favor of the team mode. The lower intelligence sub-group also demonstrated a difference significant at the .015 level (Table XXIII) in favor of the team group in Social Studies XI.

The pattern appears to have been fairly constant in sup-

porting an increased rating of school subjects by team students over autonomous students. However the "no significant difference" in English XI appears strange when placed beside the significantly higher team rating of English XII. The change from the grade eleven rating to the grade twelve rating may be accounted for by a considerable gain in the rating of the lower ability team group and a considerable loss by the lower ability autonomous group of students. With the extra pressure of the autonomous teachers in English XII toward achievement, the lower ability students might be expected to lose some interest. On the other hand, the lower ability team students continued to respond favorably to the team mode and were not exposed to as much additional pressure. The fact that the higher ability team students gained very little interest between grade eleven and grade twelve may be explained by a concern for their inadequate preparation for examinations.

Table XXIV provides data showing that those students who accepted more responsibility than they perceived English teachers willing to give them, had a significantly higher score on the Student Opinion Survey for English than did those students who accepted less responsibility than they thought their English teachers were prepared to give them. This is what might be expected if interest and acceptance of responsibility were related.

In planning the total study the decision was made to make

a check on the relative ratings of three core subjects in each of the modes. The analyses have shown a significant difference (beyond the .001 level) between subjects of the autonomous mode. On the other hand there was no significant difference demonstrated in the team school. This would seem to indicate that the team had been successful in maintaining a high level of interest in English, whereas in the control school, English had declined in relation to one of the other core subjects (Table XXVI).

D. Teacher Perceptions (Tables XXVII - XXX)

The data on teacher perceptions showed no significant differences with respect to external inputs (Table XXVII) and therefore, hypothesis 1 was not rejected. Hypotheses 2 (feedback inputs), 3 (internal capabilities), and 4 (total perceptions) (Tables XXVIII - XXX) were all rejected, showing significant differences with the team group in each case having significantly higher scores than either of the two autonomous groups. At the same time, in none of the analyses did the two autonomous groups differ significantly from each other.

In the following tables the groups may be identified as:

Group 1 - Autonomous teachers, control school

Group 2 - Autonomous teachers, experimental school

Group 3 - Team teachers, experimental school

TABLE XXVII

COMPARISON OF TEACHER PERCEPTIONS OF EXTERNAL INPUTS BETWEEN THE THREE GROUPS OF TEACHERS

Source	SS	MS	df	F	P
Groups	324.88672	162.44	2	2.10	.137163
Error	2702.5879	77.22	35		

TABLE XXVIII

COMPARISON OF TEACHER PERCEPTIONS OF FEEDBACK INPUTS BETWEEN THE THREE GROUPS OF TEACHERS

A. Analysis

Source	SS	MS	df	F	P
Groups	396.72839	198.36	2	7.64	.001769
Error	909.08739	25.97	35		

B. Newman-Keuls Comparison Between Ordered Means

Groups		2	1	3
	Means	18.579	19.222	26.100
2	18.579	--	n.s.	**
1	19.222		--	**
3	26.100			--

n.s. - not significant
** - significant at .01 level

TABLE XXIX

COMPARISON OF TEACHER PERCEPTIONS OF INTERNAL CAPABILITIES BETWEEN THE THREE GROUPS OF TEACHERS

A. Analysis

Source	SS	MS	df	F	P
Groups	695.52050	347.76	2	7.46	.001997
Error	1630.8223	46.59	35		

B. Newman-Keuls Comparison Between Ordered Means

Groups		1	2	3
	Means	53.000	56.632	64.600
1	53.000	--	n.s.	**
2	56.632		--	**
3	64.600			--

n.s. - not significant
** - significant at .01 level

TABLE XXX

COMPARISON OF TOTAL TEACHER PERCEPTIONS BETWEEN THE THREE GROUPS OF TEACHERS

A. Analysis

Source	SS	MS	df	F	P
Groups	3953.2968	1976.65	2	6.64	.003590
Error	10418.289	297.67	35		

TABLE XXX (continued)

B. Newman-Keuls Comparison Between Ordered Means

Groups		1	2	3
	Means	133.444	135.789	158.100
1	133.444	--	n.s.	**
2	135.789		--	**
3	158.100			--

n.s. - not significant
** - significant at .01 level

SUMMARY AND INTERPRETATION OF "TEACHER PERCEPTION" FINDINGS

Although in general terms teachers found the team mode more satisfying than the autonomous mode, some of the specific findings require interpretation.

The fact that there were no significant differences in the area of external inputs raises several possible conclusions:

1. That the impact of external inputs on a teacher is not affected by whether or not he is in a team.

2. That the factors included in the scale were not the most critical external inputs and therefore, did not effectively discriminate.

3. That external inputs are not particularly important to teachers and therefore, all responded in a rather neutral fashion.

Since the scores of the external input category of the Teacher Perception Scale are closely grouped about the mid-point of the scale it would appear that either conclusion (2) or (3) could be valid. In either case it might be erroneous to state that the mode has no effect on external inputs.

In the area of internal capabilities the team teachers felt more adequate to the needs of the system. It would appear logical that if individuals with differing capabilities were combined into a working group, the total group would have greater ability than any one of the individuals. However, such logic does not necessarily hold true when dealing with people, for it is possible that the combination of certain personalities will produce stress which will more than offset the anticipated gain in capability. It may also be true that if the individual areas of competence are essentially the same there will be no gain in total internal capability. The conclusion must be that for the two teams involved in the experiment the combination was advantageous.

The fact that feedback was effective between students and team teachers is supported by the replies on the student questionnaire indicating a high score on the pupil-teacher relations question. The opportunity to make use of this feedback was found to be significantly greater for the team members than for the autonomous

teachers. The advantage of the team would seem to have a strong relationship to the frequent planning meetings where the interchanges between teachers provided the mechanism for translating feedback into changes in the program.

In considering the total teacher perceptions, the fact that there were no significant differences between the two autonomous groups of teachers leads to the conclusion that it was not the general climate of one school that was different from the other but rather, it was the climate characteristic of the team mode which was different from the climate characteristic of the autonomous mode.

E. Student Preference

Of the seventy students in the team mode who underwent all the tests, sixty-nine indicated on the questionnaire that they preferred the team mode to the autonomous mode of teaching. In examining the answers to the questions some significant points were revealed which are summarized in the following list:

1. All questions produced a mean score of 3.6 or higher on a seven point scale.

2. The lower scoring group of responses related to getting prepared for final examinations, and teachers working at cross purposes.

3. The higher scoring responses related to expressing oneself, teacher-pupil relations, learning to get information, and be-

coming unbiased.

The fact that the students had experienced team teaching in only English and social studies provided them with a somewhat limited basis to make a generalized decision concerning team teaching, however after three years of exposure, they would certainly be in a position to make some judgment about its effectiveness as a mode of teaching.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

I. CONCLUSIONS

Since this study was conducted under very specific conditions in two particular schools, any conclusions drawn have relevance for that situation and are not meant to be taken as generalizations covering the whole of education.

A. The results for achievement present nearly as confusing a picture as already exists in the general research on the topic. It is not possible to conclude that there are no differences since in fact, differences did occur, but in conflicting directions. The only positive, supportable conclusion must be that for achievement in Social Studies XI the two teaching modes were equally effective, that team teaching was more effective for achievement in English XI, and that autonomous teaching was more effective for achievement in English XII.

It may be that the behaviors measured by the English XI examination were different from those measured by the English XII examination and that these behaviors were more amenable to development by the team approach than by the autonomous.

A further complicating possibility which was developed at some length in Chapter IV, is that the social studies team and auton-

omous social studies teachers were rather similar in actual operation. It would seem important then, to offer some conjecture in addition to the more formal conclusion stated. Several factors appear to lend support to an informal conclusion that the team mode would tend to produce a higher level of achievement than the autonomous mode.

1. There was a significantly higher achievement favoring the team mode in English XI.
2. The adjusted means in all the social studies analyses showed differences favoring the team mode.
3. The opposite direction of the difference in English XII was at least partially explained in describing the method of assigning staff to grade twelve classes of the autonomous mode.
4. The 1967 results on the English XII Department of Education examination produced means which favored the team mode at the .07 level of significance.

B. Females responded more positively to the team mode than did males. This was particularly evident in the achievement in the English category of the findings.

Only tentative conclusions have been formed on these particular findings as it would appear to be an area requiring further research. It may be that English is more closely related to female interests or that expectations for achievement in English are greater

for females than for males. In either case, if the team mode did provide an approach more favorable for learning it could be expected that any difference between male and female achievement would widen.

C. There was a strong tendency for students in the lower ability group to respond more positively to the team mode than to the autonomous mode.

This conclusion was supported in the areas of interest in subject matter and in willingness to accept responsibility as well as in achievement.

An examination of the procedures followed by the team indicated that the key to the response of lower ability students lay in two main aspects of the program; the practice of restructuring groups for remedial work, and the approach to seminar groups. Periodically the teams, finding certain gaps in student information or understanding, would re-group for remediation in one section and enrichment in another. Normally, after a short period of time students would return to their normal groups and program. The assignment of students to seminars and the activities there, may have assisted in making the program more relevant to students who frequently were left untouched by the autonomous approach.

D. Under the team mode the more able students were willing to accept more responsibility than they believed their teachers were willing to grant.

If the development of responsibility in students is a legitimate objective it would appear that teachers must give more serious attention to a differentiation of the kinds and levels of responsibility which different groups of students are willing and able to accept.

E. There was a strong tendency for students to show a higher level of interest in subjects studied under the team mode than under the autonomous. This difference in interest was most noticeable in English at the grade twelve level.

If, as the program of studies issued by the Department of Education for Manitoba states, one of the objectives of the teaching of English is to develop an appreciation for literature, then certainly the development of significantly greater interest for English under the team mode has important implications.

F. Teachers found the team teaching mode significantly more satisfying than the autonomous mode.

Relating this conclusion to the theory discussed in Chapter II, it would seem that the increased professional satisfaction was at least partially the result of improved feedback mechanisms and increased internal capabilities. In more specific terms, teachers in a team situation had more effective methods of obtaining feedback from students and colleagues and were better equipped to translate the feedback into adjustments to their system. As Ryans (1963) pointed out, the translatable nature of the feedback is critical, for

failure to understand it will result in stress within the system and eventual collapse or explosion. There are probably more suitable interpretations of these terms with respect to teachers than the literal ones but in any event, the team is more likely to react positively to its environmental situation than is the autonomous teacher.

G. Students of the experimental school preferred the team mode to the autonomous mode of teaching, indicating teacher-pupil relations and the development of techniques for investigation as particular areas of satisfaction.

Although the foregoing conclusions indicate some extension of knowledge about team teaching, the gaps in research which were indicated in Chapter II remain only partially filled.

The very limited examination and testing of theoretical considerations produced significant findings in the study and pointed toward the desirability of further research based on a more complete theory of team teaching.

There appears to have been considerable merit in extending this study over a three-year period, thus giving greater opportunity to examine the team approach under nearly normal conditions.

The study of two dimensions in addition to achievement has broadened the base of knowledge about team teaching and indicated the possibilities of further areas of research.

Finally, the attempt to give detailed descriptions of the

operation of the two modes did not in any way establish controls and therefore, the possibility still exists that similar modes of teaching were compared. This weakness found in many studies requires further attention.

II. RECOMMENDATIONS FOR FURTHER RESEARCH

A close association with the project for over three years has led the researcher to identify a number of areas which require further research before satisfactory conclusions can be drawn. There have also emerged a variety of related topics which are in need of research-supported information. The suggestions are in no particular order of significance.

A. The nature of the team approach with its increased emphasis on better preparation, specialized "presenters," and more audio-visual materials might well have a particularly strong impact on the affective domain of learning. There are many possible research topics in the various interactions of the facets of team teaching with the different domains of learning.

B. Rather closely related to the first concern is the whole question of "protocols" or techniques of teaching. Although Ginther (1962) has done work in this area and the various approaches to interaction analysis offer promising techniques, it would seem that future researchers might profitably spend time in carefully identifying the

protocols to be used by the different groups in a project. Then throughout the course of the experiment, analyses to determine the degree of deviation from the established approach would assist in maintaining adequate controls. This might serve to free studies from the suspicion that two samples of the same kind of teaching were being examined.

C. The possibility that one subject area may be more suitable for a team teaching approach than another subject is a topic worthy of research.

D. It may be useful to determine whether the team or the autonomous teacher can be most effective in developing behavioral objectives relevant to both student needs and the general objectives of the particular school system. Related to such a study could be the development of ways to assess the achievement of these objectives.

E. The whole area of reasons underlying teacher preference for team teaching is a fruitful area of further research. More direct attention might be given to the factors summarized by Lundrigan (1966) and the extent to which the team or autonomous mode permits the realization of each factor. Some of the other external input elements of Ryans' (1963) theory, such as administrative policies, school law, counselling procedures, the culture of the

community, and the base of knowledge of pupils, might be examined. Certainly the factors that were considered in this study might be researched more exhaustively in a study devoted exclusively to those areas of concern.

Researchers associated with teacher organizations might be particularly interested in pursuing some of the implications for staff structures. It is distinctly possible that teacher professional satisfaction can be more effectively achieved through a totally new structure which might be patterned on one of the types of team organizations. Such studies might suggest not only a new career structure but also point to a completely different basis for salary scales.

F. The conclusion that females responded more positively to the team mode than did males requires further investigation. The differing role expectations, relevant differences in psychological characteristics, or the nature of the subject matter, all provide avenues of research into this topic.

G. The conclusion that higher ability students were prepared to accept more responsibility than their teachers were willing to offer, provides another source of research topics. The current student unrest is directly related to the matter of responsibility and the level which schools are prepared to allow or encourage students to accept. The levels of independence compatible with certain teaching modes

would seem relevant to this problem.

H. Again in relation to independent inquiry it would appear that there is a need for teachers to be able to classify effectively assignments, tasks, projects, student proposals, etcetera, into various levels of directedness. That is, where along a continuum of directedness (teacher directed to pupil assumed) would a particular item lie? Such a measure might assist in teacher efforts to encourage gradually student acceptance of responsibility. The development and testing of such a scale might be a useful project.

Finally, the whole area of replication of the study or a portion of it represents a further avenue for research. Here the main concerns should be to tighten controls further and refine instruments to the point where conclusions will become clearer and of more immediate application to the practitioner.

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APPENDIXES

APPENDIX A

STUDENT-STAFF INFORMATION

TABLE I

TEACHER CHARACTERISTICS
(as of June, 1966)

Group	Male-Female Ratio	MEANS Age	Years of Teaching Experience in the Subject Field	Years of Professional Training	Years of Academic Training in Subject Fields
Autonomous					
English	1/5	31.7	8.8	1.33	3.5
Social Studies	3/5	29.4	4.8	1.4	3.0
Team					
English	2/4	30.3	4.7	1.5	3.8
Social Studies	2/2	40.2	7.2	1.25	3.5

TABLE II

STUDENT POPULATION

Group	1963-64	1964-65	1965-66
Autonomous	768	781	748
Team	406	551	688

TABLE III

PUPIL-TEACHER RATIO

Group	1963-64	1964-65	1965-66
Autonomous	18.3	17.3	16.0
Team	16.2	18.3	18.6

TABLE IV

FREQUENCY DISTRIBUTION OF I.Q. SCORES

Class Interval	Frequency Team	Frequency Autonomous
156 - 160	1	
151 - 155	1	
146 - 150	1	2
141 - 145	4	0
136 - 140	2	4
131 - 135	4	2
126 - 130	7	4
121 - 125	9	12
116 - 120	9	6
111 - 115	14	14
106 - 110	9	6
101 - 105	5	2
96 - 100	3	1
91 - 95	1	
N	70	53
Mean	119.7	119.9
S.D.	13.6	10.8
Median	119.4	119.2

APPENDIX B

Q-SORTS

Q-SORTS INSTRUCTION SHEET

1st administration

(1) Write on board: "Whose job do you think it is to:"

(2) Draw on the board:

S	ST
Student	Student & Teacher
T	N
Teacher	Neither

(3) Distribute one package of Q-Sorts, one "YOU" tally sheet, and two "TEACHER" tally sheets, to each pupil.

(4) Tell the students: "take the four slips of newsprint from the page of Q-Sorts, print the letters and words shown on the board and arrange them in four separate positions on the desk."

(5) Tell the students to: "sort all the Q-Sorts into the appropriate four piles. The decision on which pile to place it is reached by asking for each one, the question--whose job do you think it is to:"

e.g. a. determine who is to repair a broken desk. If you decide that this is the job of neither the teacher nor the pupil, you should place it in the pile marked NEITHER.

(6) Say: "There is no time limit. BEGIN."

(7) After all students have finished the sorting say: "On the appropriate tally sheet write opposite each Q-Sort number the letter S, ST, T, or N according to the way in which you sorted them."

(8) Fill in the name, school, and class on the tally sheet.

2nd administration

(1) Change the statement on the board to read: "Whose job do you think the teacher would say it is to:"

(2) Ask the students to shuffle the Q-Sorts.

(3) The "teacher" is to be the English teacher (literature if more than one).

(4) The rest is the same except that on the tally sheet the name of the teacher and "English" should appear.

3rd administration

Same as above but the "teacher" this time is to be the History or Geography teacher.

Q-SORTS

The Q-Sort instrument administered to each student in the fall and spring of each year contained the following materials: 28 tasks, each listed on a separate 3 x 5 card, numbered from 10 through 37 and arranged in random order; 4 category sheets; 1 tally sheet; and 1 instruction sheet.

The tasks and the subscore categories to which they belong (in parentheses), are as follows:

10. determine how the student is progressing, how well he is doing apart from examinations (evaluation)

11. decide on how the student's final grade is to be determined (evaluation)

12. decide on how the student can deal with those areas in which he is weak (evaluation)

13. decide what student(s) would investigate special problems arising out of class activities (evaluation)

14. determine ways in which the student can make better progress in the course (evaluation)

15. see that the student takes good notes in the course of class lectures, readings, and film materials (evaluation)

16. identify ways in which the course could be improved and made more interesting (evaluation)

17. decide whether the student needs special help (evaluation)

18. decide what the student can expect to learn in the class (learning experiences)

19. see that the student understands the ideas and principles in the course (inquiry)

20. see that the student knows how to use information already learned, to attack new problems (inquiry)

21. see that the student is familiar with current topics related to his study (inquiry)

22. think up assignments which would illustrate the fundamentals discussed in class (inquiry)

23. interpret the materials used in the preparation of an assignment (inquiry)

24. draw conclusions from assignments given during the course (inquiry)

25. identify and define the principle that an assignment is supposed to illustrate (inquiry)

26. determine when the student has enough data and of the right kind to answer the question in a problem (inquiry)

27. decide the exact procedure or way in which an assignment is to be done (inquiry)

28. raise questions that challenge the conclusions drawn by other students from their assignments (inquiry)

29. locate other reference material such as books, articles in magazines and periodicals, etc., that are related to the course (learning experiences)

30. select the assignments that are to be done in the course (learning experiences)

31. identify the chapters, pages, etc., in textbooks, magazines, and periodicals that are related to the course (learning experiences)

32. determine what kind and how much homework is done by the student (learning experiences)

33. determine how many assignments are to be done by a given student (learning experiences)

34. decide whether the amount and quality of work done in a task are adequate (evaluation)

35. determine what kind and how much use the student makes of the available resources (learning experiences)

36. make certain that the class pays attention (learning experiences)

37. decide whether and how a student is disciplined (learning experiences)

Sub-score categories:

Evaluation: 10, 11, 12, 13, 14, 15, 16, 17, 34. (9)

Inquiry: 19, 20, 21, 22, 23, 24, 25, 26, 27, 28. (10)

Learning Experiences: 18, 29, 30, 31, 32, 33, 35, 36, 37. (9)

TEACHER _____

SUBJECT _____

Name _____

School _____

Class _____

_____10
_____11
_____12
_____13
_____14
_____15
_____16
_____17
_____18
_____19
_____20
_____21
_____22
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_____30
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_____34
_____35
_____36
_____37

(The tally sheets were coded for each administration so that they would be easily identifiable.)

SCORING

The Q-Sorts were scored according to the following point system: S = 4, T = 3, ST or TS = 2, N = 1. The total score for each student was computed by adding the scores for all tasks. The three sub-scores were computed by adding the scores in each sub-score category.

Q-SORT RELIABILITY

Reliability of the Q-Sort instrument was tested in two University of Chicago Laboratory High School physics classes. The two administrations of the Q-Sort were separated by one day.

The correlation between Administration I and Administration 2 in Group 1 was .708.

The correlation between Administration 1 and Administration 2 in Group II was .599.

The correlation between Administration 1 and Administration 2 in the combined groups was .649. (Fritz, 1963)

APPENDIX C

STUDENT OPINION SURVEY

STUDENT OPINION SURVEY

Name _____ School _____

Class _____

Students differ in feelings about the courses they are taking in school. We would like to know how you feel about the courses that you have.

The task is for you to rate all of the courses given at the top of the next page on the list of items 1-19. Read each statement carefully. Then place the letter symbol for each course in the space on the scale that best represents your opinion about this course. For instance, a student taking E English, SS World History, PE Physical Education, Ma Algebra, and Sc Biology rated these courses on the following statement in this manner:

"To what extent do each of your classes consist of students whom you admire?"

. Ma . Sc . . . PE . . E . . . SS .

not at all completely

Notice that this student placed the letters SS at the extreme right of the scale. This indicates that he admires all the students in his World History class. The letters Ma are placed on the extreme left of the scale, indicating that there are no students in Algebra that he admires. In his opinion the other courses fall between these extremes and are rated accordingly. However, another student might have placed his ratings all on the left end of the scale, while still another student would want to use only the right end. From this you can see that you should feel free to use that part of the scale that best represents your opinion about the statement. Finally, as in the example, you are to use the spaces provided between the points on the scale. Please do not place any ratings above the points themselves.

Remember you are to rate all of your courses on an item before you proceed to the next item.

Letter Symbol	Course Title	Letter Symbol	Course Title
E	English	Sc*	Science
SS	Social Studies	PE**	Physical Education
Ma	Mathematics		

* Students taking more than one science will use the one they like most.

** Grade XII students will <u>not</u> record this subject.

1. In general, how meaningful and rewarding is each of your courses?

not at all ——————————— completely

2. To what extent does each course make use of subject materials of the sort you would like to study or work with next year?

not at all ——————————— completely

3. To what extent does each of your courses deal with things that are interesting to talk about outside of class?

hardly ever ——————————— most of the time

4. To what extent does each of your courses have a group of students you would like to work with again next year?

not at all ——————————— completely

5. To what extent are you willing to do the work required in each of your courses?

not at all ——————————— completely

6. To what extent does each course further your plans for things you want to do after you leave high school?

not at all ——— completely

7. In what ways have each of these courses opened new interests or things for you to do?

no ways at all ——— lots of ways

8. What per cent of the time in each course is spent on activities which personally you enjoy?

none of the time ——— all of the time

9. To what extent does each course have a teacher(s) with whom you would like to work again next year?

would not like at all ——— would like completely

10. To what extent to you look forward to going to each of these courses?

not at all ——— completely

11. To what extent have each of the courses given you as an individual opportunity to practise or try out some special skill or talent which you have?

little or no opportunity ——— lots of opportunity

12. To what extent in each course are help and assistance available (teachers, facilities, materials, etc.) to further your own learning?

not at all ——— completely

13. What part of the time in each course is spent on activities in which you are really concentrating and working hard?

none of the time ——— all of the time

14. To what extent is (are) the course teacher(s) familiar with you and your work?

not at all ——— completely

15. How often in each course have you opportunity to pursue a particular question, idea or personal interest,

none of the time ——— all of the time

16. How fair is the evaluation of your work in each of your courses?

not at all ——— completely

17. How much opportunity in each of your courses do you have to contribute to the progress of a group of students in a common activity?

little or no opportunity ——— lots of opportunity

18. To what extent are you encouraged to work up to your capacity in your courses?

hardly ever ——— most of the time

19. To what extent are you expected to work beyond your capacity in your courses?

hardly ever ——— most of the time

APPENDIX D

TEACHER PERCEPTION SCALE

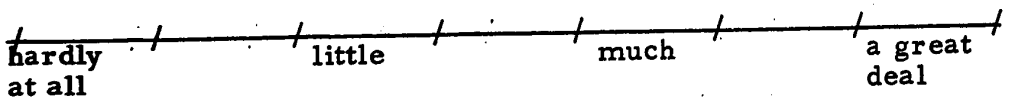
TEACHER PERCEPTION SCALE

NAME _____

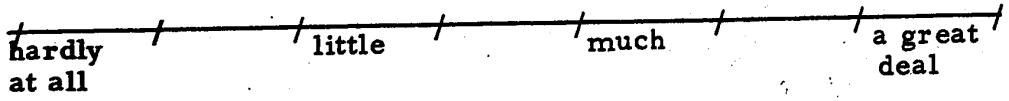
SUBJECT(S) _____

I Check anywhere along the line to indicate your judgment of the extent to which (or the frequency with which) the organization of the school contributes to each of the following:

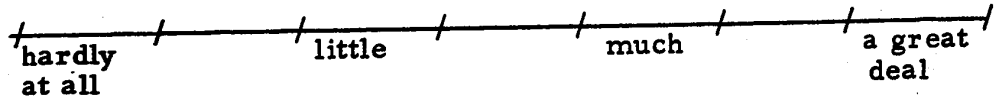
1. The adaptation of instruction to meet individual pupil differences.



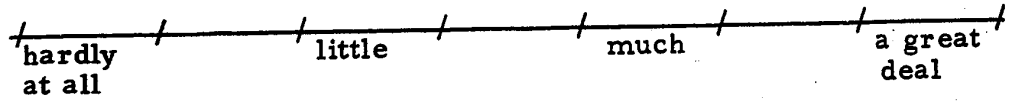
2. Growth in teacher competence.



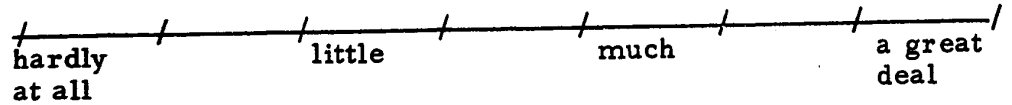
3. Preparation of pupils for final examinations.



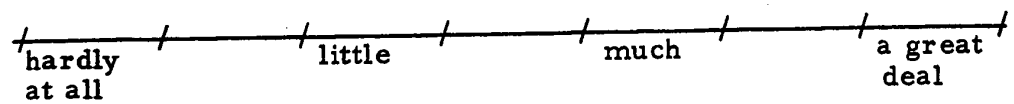
4. Adaptation of instruction in response to pupil reaction.



5. Adjustment of new teachers to the school program.

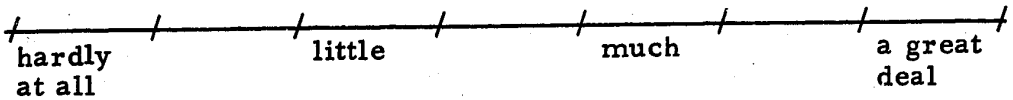


6. Intellectual isolation from colleagues.



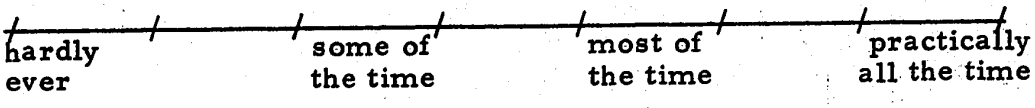
7. Development of common aims of education among teachers.

8. Teacher involvement in the identification of goals for pupil learning.

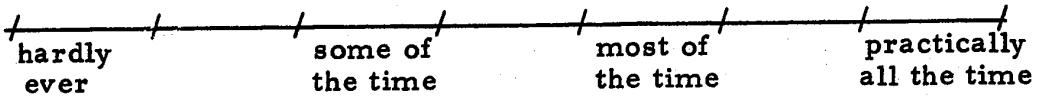


9. Adaptation of organizational structure in response to teacher reactions.

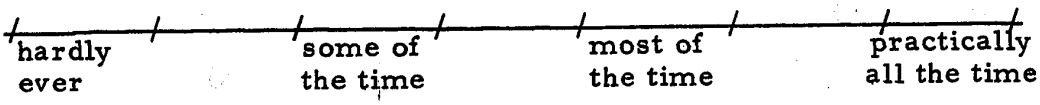
10. Burdensome lesson preparation time.



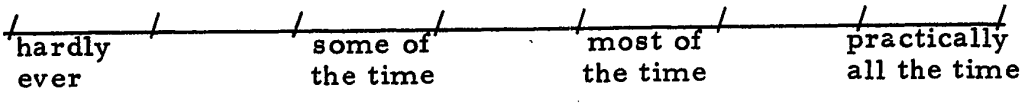
11. Use of observations and criticisms of lessons by colleagues.



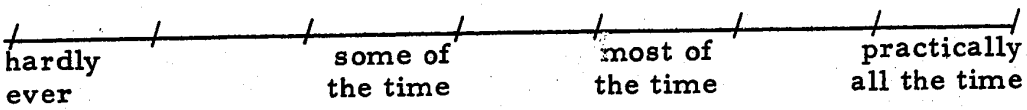
12. Professional differences between teachers leading to serious disruption of the instructional program.



13. Personal differences between teachers leading to serious disruption of the instructional program.

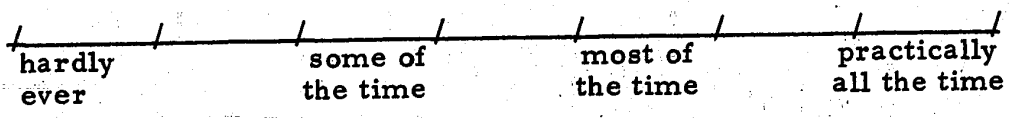


14. Teacher involvement in the grouping of students.

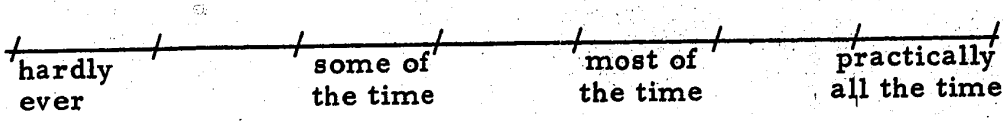


15. Use of community resources.

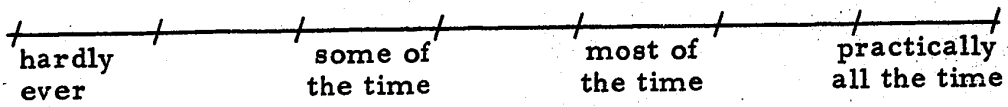
16. Effective teacher-pupil interaction.



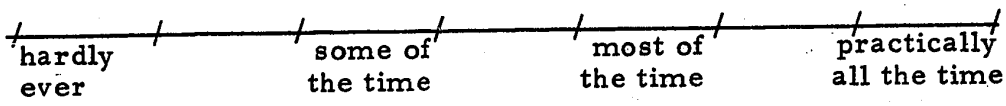
17. Teacher use of the specialized knowledge of colleagues.



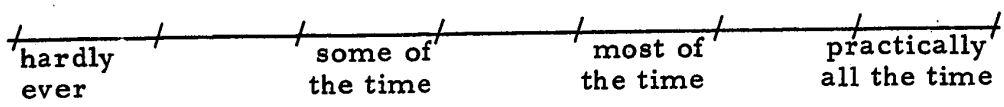
18. Professional differences between the school administration and teachers leading to serious disruption of the instructional program.



19. Personal differences between the school administration and teachers leading to serious disruption of the instructional program.



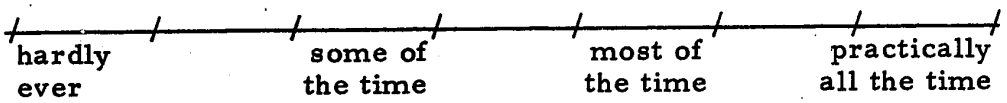
20. Pupil use of instructional materials.



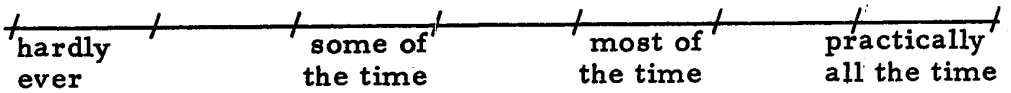
21. A pattern of space allocation which restricts teaching activities.

22. Pupil understanding of basic ideas.

23. Teacher use of instructional materials.



24. Pupil discipline problems.



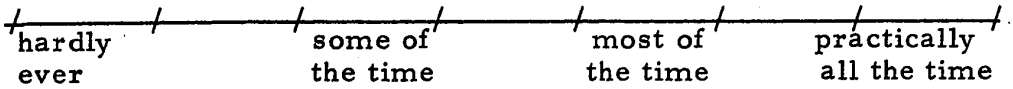
25. Effective school use of different teacher capabilities.

26. A pattern of time allocation which restricts teaching activities.

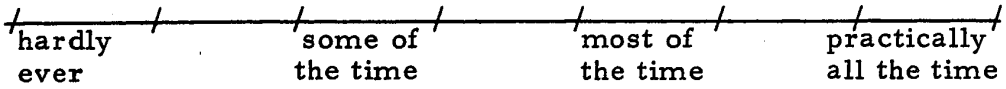
27. Opportunities to use a variety of teaching methods.

28. Serious interference in planning lessons.

29. Opportunity for teachers to fulfill their own idea of what a teacher should be.



30. Fruitful contact with parents.



31. Necessity of contact with administrative personnel.

32. A pattern of instructional materials allocation which restricts teaching activities.

Sub-score categories:

External Inputs: 7, 8, 9, 14, 15, 18, 19, 20, 21, 23, 25, 26, 28, 31, 32. (15)

Feedback Inputs: 4, 11, 16, 24, 30. (5)

Internal Capabilities: 1, 2, 3, 5, 6, 10, 12, 13, 17, 22, 27, 29. (12)

II On the basis of your experience and/or other sources of information, what do you consider to be the most important advantages and disadvantages of team teaching?

Advantages	Disadvantages
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____

III 1. On the basis of your present knowledge about team teaching, would you like to be involved in a team teaching program next year?

definite no qualified no undecided qualified yes definite yes

2. If you gave a "qualified" answer, what is (are) the qualification(s)?

_____

_____

_____

_____

APPENDIX E

PUPIL QUESTIONNAIRE

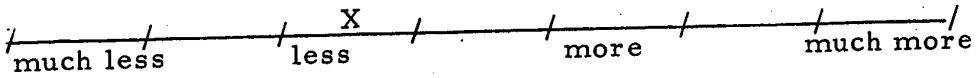
PUPIL QUESTIONNAIRE

NAME _____

ROOM _____

I Check anywhere along the line to indicate how the team teaching method provides an opportunity for the activity in comparison with the usual teaching method.

e.g. The discussion of term examination results.



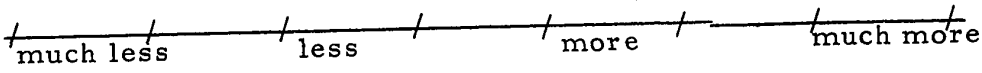
Here the pupil indicated that the team teaching method provided less opportunity than the usual teaching method for the discussion of term examination results.

1. Provides an opportunity for:

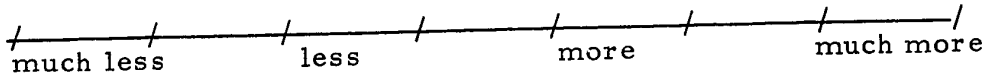
   Satisfactory relations with your teacher (s).

2. Provides an opportunity for:

   Giving you new ideas.

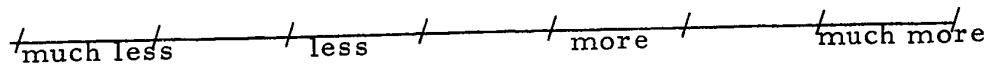


3. Learning how to review work already taken in class.

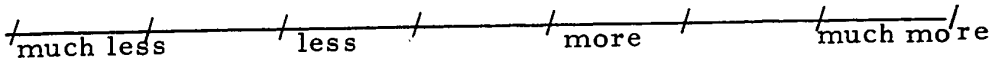


4. Getting prepared for final examinations.

5. Learning how to express yourself (orally).



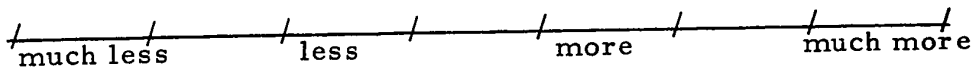
6. Learning how to express yourself (written).



7. Learning how to get information by yourself.

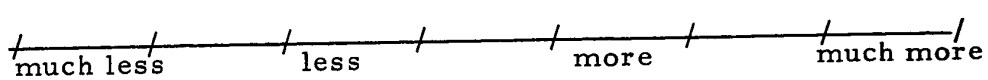
8. Wasting time in class.

9. Making ideas clearly understood.



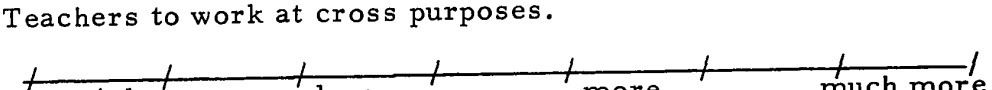
10. The satisfaction of your needs.

11. The development of your self-confidence.

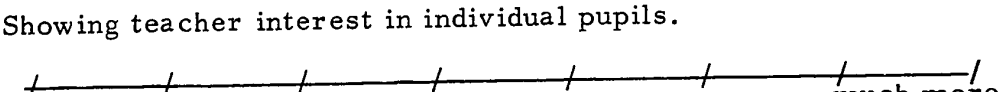


12. Learning useful facts.

13. Teachers to work at cross purposes.

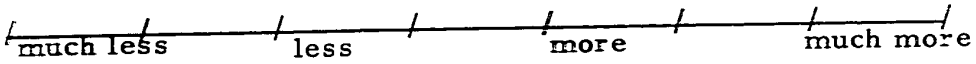


14. Showing teacher interest in individual pupils.

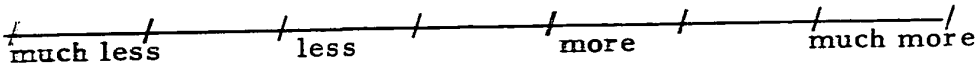


15. Pupil frustration.

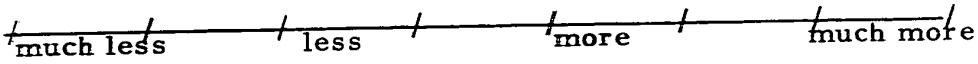
16. Becoming unbiased in considering the views of others.



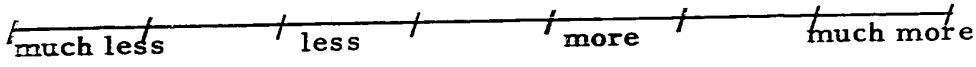
17. Getting to know your classmates.



18. Getting a variety of opinions about particular topics.



19. Achievement to your capacity.



20. Using resources in addition to the teacher (s).

II Assuming your present knowledge about team teaching and the "usual" method of teaching; if you were starting high school (Grade X) next fall, which method would you prefer?

Check one:

usual method ____

team teaching method ____