THE EFFECTS OF DEPARTMENTALIZATION ON STUDENT ACHIEVEMENT
AT THE SIXTH GRADE LEVEL

BY

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ABSTRACT

Organization for the best learning situation is a problem to be considered by all persons involved in elementary education. There have been various attempts in the past to improve the learning situation in the elementary grades due to a common feeling among educators that the self-contained classroom organization does not meet modern needs. Because there is a lack of experimental evidence concerning this problem as was pointed out in the review of literature section of this paper, this study was made in an attempt to provide some evidences to support one form or the other of classroom organization.

The specific problem dealt with in this paper was to determine whether pupil achievement at the sixth grade level would be increased in a departmental classroom organization as compared to a self-contained classroom organization as indicated by standardized achievement tests. The hypothesis held was that gains in achievement by the departmental group would be greater at the end of one school year than would be made by the self-contained group in the areas of English, math and science.

Procedures of this study included a review of literature which indicated that departmentalization has a long history in our country, but has disappeared in the main from most elementary schools for no apparent reason since many authors defend its worth with the same arguments presented by writers defending the self-contained classroom organization. Further procedures following the statement of problem involved the setting of limitations for this research. Factors included were location for tests, organization of experimental and control groups, choice of standardized test, pupil restrictions and teacher restrictions.

Specific characteristics of the study included facts about the city of Austin, Minnesota, the school system and other factors which made this study unique.

Conclusions drawn as a result of this study were (1) departmental classroom organization provides for increased pupil achievement to a higher degree than is provided for by the self-contained class organization, (2) the departmental classroom is a superior form of organization as compared to the self-contained classroom, and (3) elementary teachers allowed to teach specific areas of interest in a departmental classroom provide for better pupil achievement than do elementary teachers teaching all classes in a self-contained classroom.

Recommendations made as a result of this study suggested that further research in other areas of the elementary curriculum and at other grade levels be carried out, that extended exploration in science was necessary since the results of this study indicated no difference in achievement, that elementary teachers should be encouraged to pursue specific interests so that they may specialize in certain areas, and that all persons in all communities should examine the self-contained classroom organization in view of the study made to weigh departmentalization as a potential means of improving achievement by pupils today to meet the needs of citizens tomorrow.
CHAPTER I
INTRODUCTION

Organization for the best learning situation is a problem to be considered by all persons involved in elementary education, and indications are that it has been so since early times. Broadhead\textsuperscript{1} has made extensive studies in this area, and indicates that much research is still necessary to reach the most practical learning situation in the upper elementary grades.

There have been various attempts in the past to improve the learning situation in the elementary grades, some of these being total departmentalization, dual progress plans and various divisions of other kinds to improve on the most common used self-contained classroom as is found in most elementary schools. Heathers\textsuperscript{2} encourages these attempts by indicating that there are many holes in the elementary program due to the self-contained class system, and that they are covered by patchwork.

Today, there still exists the problem of which is best, the self-contained classroom as defended by many, or departmentalization of a varied kind, being explored and pressured by others. As will be indicated in the next section of this study, a satisfactory research project has not yet been made to demonstrate the value of one over the other, although many studies have been carried out in all parts of the United States in recent years.


Studies carried out to date concerning departmentalization have all indicated that there are no recognizable gains indicated as far as pupil achievement is concerned. However in a recent study by Gibb and Maltala,\textsuperscript{3} the conclusions were that some subjects may be best taught in a departmentalized situation. Other studies made by Otto\textsuperscript{4} suggest that children learn best in a self-contained classroom.

Due to the varied and inconclusive evidences indicated by research concerning the problem, this study was undertaken in an attempt to explore pupil achievement through departmentalization as opposed to the self-contained classroom in the academic areas of science, math and English in the sixth grade.

Statement of Problem

The problem dealt with in this research was to determine whether pupil achievement at the sixth grade level would be increased in a departmental organization as opposed to the self-contained organization covering the same units of study, as indicated by standardized achievement tests.

The major hypothesis held was that gains in achievement by the departmental classes would be greater on the standardized achievement test scores at the end of a one year period in schools using the departmentalized organization in the sixth grade than would be shown by the self-contained


group in the areas of English, math and science.

Procedures

The procedures of this study included a review of the literature to ascertain what others had discovered about the values of departmentalization as opposed to the self-contained classroom.

The teachers involved in this study were selected according to their present teaching assignments. The specific area of testing included the sixth grades in the Austin, Minnesota elementary school system. Two elementary schools, Banfield and Shaw, consisting of three sixth grade groups each, were chosen as the experimental group, since the departmental system is being used in those schools. The pupils in the sixth grade in six other elementary schools were chosen as the control group, utilizing the self-contained classroom organization.

The Austin elementary school system places all sixth grade students into heterogeneous groups, ranging from low to high ability in each section. Thus, the equating of groups involved a comparison of scores made by the experimental group and the control group following the fall achievement tests. Following the first series of tests, a full school year of subject matter over the same basic units of required curriculum was taught in both groups. At the end of the school year, the identical tests were again administered, and the scores of each group were compared a second time. The results of the two tests taken by each group were then compared, to measure the amount of learning which had taken place within each group. This measure of learning growth was then compared by groups, to determine which group had made the most achievement gains throughout the school year.
The Metropolitan Achievement Test for grade six, form B, and its alternate, form CM, was selected for measurement. This particular achievement test has been utilized by the Austin Public Schools in past years for various reasons. Some of these include the familiarity of administration by most teachers and it is considered a reliable and valid measure of the subject matter they desire taught.

Limitations

Limitations affecting this study were: (1) the sample was confined to pupils and teachers in one school system located in Austin, Minnesota, (2) three areas of academic subjects were compared, (3) only students remaining in each specific school throughout the school year were used, (4) the teachers of the experimental group were volunteers by subject interest rather than having specialized training in the areas surveyed, (5) the period of research covered one school year at the sixth grade level, and (6) the measurement of pupil achievement was confined to the Metropolitan Achievement Test, form B, which was administered at the beginning of the school year, and was repeated in its alternate, form CM, at the end of the same school year.

Definitions

For the convenience of the reader, two terms used in this study are defined.

A departmentalized class is defined as the division of the school organization into departments by subject area, with each teacher being responsible for teaching one or more, but not all subjects in the curriculum. The departmentalized classes in this study were made up of
heterogeneous ability pupils, divided into equal numbered classes, who move from room to room during each school day to receive instructions from various teachers specializing in the teaching of various subjects.

A self-contained class is defined as a heterogeneous group of pupils who remain in one classroom for most of the day, under a single teacher covering all areas of instruction.

The first step in this study was to review the literature in the field. The results of this review are discussed next.
CHAPTER II
REVIEW OF LITERATURE

In reviewing the literature on this topic, an attempt was made to locate information supporting the departmentalization theory as well as the self-contained class. Since these two basic plans are to be considered in this study, a brief history was sought to form background information explaining why there is a general difference of opinion concerning this problem. Following the brief history, some of the arguments supporting each form of classroom organization are discussed.

A Brief History of Elementary School Organization

A study reported by Dunn in 1952, relates the history of elementary organization from earliest times in the United States, with the establishment of reading and writing schools in colonial times. As school organization progressed prior to 1952, variations of organization were tried in an attempt to organize for the most effective learning situation. During the early colonial period, the day was divided into two parts, the reading school and the writing school, according to teacher ability. Pupils changed from one section to the other on a half-day schedule, thus presenting the first form of departmentalization. If a teacher was hired who was proficient in both areas, the pupils were retained for the whole day by that teacher, teaching both divisions. Thus, the first self-contained classroom was formed. In later years, arithmetic and

language were added, followed by the addition of other subject matter, eventually bringing the curriculum up to seven or eight subjects per day. Educators familiar with both forms of organization discussed the merits of each, developing one or the other to best suit their needs, and the pendulum swung back and forth throughout the years up to the present time, leaving educators of today to wonder on the merits of one form over the other.

Sample studies have been carried out and written up at varied intervals over the past years to determine the type of classroom organization being most used, one of the earliest being reported in 1929 by Otto. He surveyed cities with populations of 2,500 to 25,000 in 31 states, to determine to what degree they were departmentalized. He found that 37 o/o of the cities studied were using departmentalization in their elementary schools at that time, indicating a swing toward it. However, a similar study was made by Prince in 1942, who showed departmentalization on the decrease, with very few cities utilizing departmentalization and some indicating they felt it was on its way out. The swing back toward the self-contained class occurred chiefly in the years of 1932, 1935, 1937, and 1940, according to the studies cited.

During this period of indecision, various other studies were carried out by educators in an attempt to determine the value of one form of organization over the other. Although these studies included many facets of

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the total program, no conclusive evidence for either side was demonstrated, although the writers usually made recommendations supporting their primary hypothesis. Because of these repeated failures to provide conclusive evidences, agitators on both sides continued to recommend a favorite form of organization through articles in periodicals, suggesting various reasons why a certain form should be adopted.

The Encyclopedia of Education Research verified the previous statements and suggested that further research be carried out covering the various issues concerning departmentalization and self-contained classrooms. It also indicated that unless such research can demonstrate the values of departmentalization over the self-contained class, agitation for its application should be abandoned.

In reviewing this section, a brief history was discussed, dating the problem of departmentalization as opposed to the self-contained classroom back to colonial times. The earliest forms of organization were examined, along with surveys at intervals since then. It was noted that there seemed to be a shifting of the preferred organization through the 1920-1930 era, finally settling on the self-contained classroom as the most common form. Continued agitation for departmentalization is carried on however, and conclusive evidence supporting it has not been found. Because of this, a study of each basic form was carried out, in an attempt to clarify the issues supporting each.

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The Departmentalized Class

In his book entitled The Dual Progress Plan, Stoddard devotes a part to the modern concept of the departmental system. He implies that the need for specialized teachers in certain areas of instruction arose as the material to be taught became more complex, and that it was impossible for one teacher to be an authority in all areas of curriculum. Although the theory of departmentalization has been widely accepted and utilized at the high school level, attempts to carry it out at the elementary level have failed in the majority of elementary schools in the United States.

Anderson and others maintain that the departmentalized system under specialized teachers in academic areas will improve the quality of elementary education. Dunn combines the basic factors suggested by these authors, and lists those most commonly acclaimed. A departmental program in the elementary school would (1) utilize teacher personnel trained for specific fields, (2) assure a variety of methods and approaches gained by experiences with several teachers, (3) stimulate personality growth through contacts with a variety of teacher personalities, (4) permit the program


Dunn, op. cit. p. 6.
to become adjusted to the needs and desires of individual children, (5) provide a changing program keeping alive the keen interest and alertness of the child, (6) raise standards of scholarship, (7) provide a broader viewpoint due to varied school experience, (8) allow teachers to be masters in their field, (9) prevent duplication of equipment, (10) prevent parts of the school program from being neglected and (11) provide for specific programs needed, as weak areas are uncovered.

The factors listed stress the strengths of the departmental program and encourage administrators to consider experimentation. Efficient teachers, economy of school funds, wider experiences for pupils and other factors are basic considerations. Not to be overlooked in this study, however, are the factors stressed by defenders of the self-contained classroom organization, to be covered next.

The Self-contained Class

In contrast to the many articles cited defending the values of the departmental system, an equal amount of writings have been found to support the self-contained classroom organization. Authors of this form of organization maintain that it best fulfills the needs of elementary children. Haan and others\(^8\) present common arguments also summarized by Dunn\(^9\).

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The self-contained classroom organization (1) assures emotional stability in most cases by being well-ordered and continuous, (2) allows continuous process of learning, not interrupted by specific time allotments, (3) allows for the learning of a whole child, rather than a compartmental learning situation, (4) allows for individual personality problems, (5) becomes a home rather than a factory, (6) reduces salary costs by being general rather than expert, (7) provides for easier pupil control, (8) does not tend to over-emphasize any certain subject, (9) has a stronger psychological foundation to support its use, (10) does not require stressing of the homeroom as in departmentalization, and (11) provides for less time spent in pupil accounting.

The factors listed tend to point up the importance of the whole child, stressing the emotions, the personality and the psychological effects. Economy is considered, and the time factor mentioned. The factors listed also encourage administrators to continue in the use of the self-contained classroom, feeling that its organization fills the needs of the elementary pupil.

Summary

Departmentalization is not a new concept in elementary education, its history dating back to colonial times. First, reading and writing schools were organized, then changing into a single school, a turn to departmentalization to large extent by 1930, then a return to the self-contained class during the years following. Numerous articles have been written in recent years stressing the value of each organization, without the location of conclusive evidence to support either the claims for
departmentalization or for the self-contained classroom. Defenders of the departmental system claim the strength of their program lies in its economy, variety of experiences, efficient teachers and other factors, while defenders of the self-contained class claim teaching of the whole child, emotional stability, personality building and psychological effects as some of its basic strengths. Research covering the various areas of departmentalization was recommended, which was attempted in this research. The specific characteristics of this study are discussed next.
CHAPTER III
SPECIFIC CHARACTERISTICS OF THIS STUDY

In carrying out this study, specific characteristics are discussed which have bearing on its final conclusions. A description of the community and the school where the testing took place is given to familiarize the reader with a basic picture of the city, the school, and the people involved. A second part, the exact procedures of this investigation are discussed, so that a thorough understanding of the framework of this investigation is established, leading to the conclusions finally drawn in a later chapter.

The Community and the School

This study was restricted to the community of Austin, Minnesota, a city of approximately 30,000 people, located on the southern border of the state. Austin is a typical midwestern community in many ways with very ordinary ideas, desires and interests, as can be found in most American cities of its size. Austin industry is centered around the Hormel Meat Packing Company, which was begun in Austin and has grown to become one of the world leaders in that industry. One of the largest packing plants and the head offices are maintained in Austin. The majority of the population depends on the Hormel Company in some way for its income, and most of the minor industries in the city are located there chiefly due to the purchasing of their products by the Hormel Company.

Due to the unique organization of the Hormel Company, a profit sharing plan is enjoyed by all the employees, thus, the standard of living enjoyed by the laboring class is much above the average of laborers
in other industries doing similar work. This point is brought into ac-
count since the higher incomes of the majority of the Austin population
have in its history, also had bearing on the school, its facilities and
its faculty due to its ability to pay higher taxes and to offer more sup-
port for education on the local level.

Another unique feature concerning Austin is that it contains no
specific slum or poor area. A visitor would find residential areas in
all parts of the city to appear similar, with homes ranging from expen-
sive to inexpensive often sitting side by side. Because of this fact,
the attendance areas are very similar and hence the children in each of
the elementary schools have a very similar socio-economic grouping, there-
by allowing the writer to compare schools on an equal basis, without
accounting for great differences in social and economic backgrounds ac-
cording to the various schools.

In the State of Minnesota, Austin has long been considered a leader
in public education. The operation of the schools is considered progres-
sive in that a great deal of experimentation in educational procedures
takes place, and the faculty is encouraged to bring in new ideas and
methods in an attempt to continually improve and provide better education-
al practices. Of the approximately 400 professional educators in the
system, over 90 0/o of them have at least a bachelor degree, over 50 0/o
hold a master degree, and over 30 0/o have six or more years of profes-
sional training. In comparison with other cities of similar size in Min-
nesota, Austin claims the least yearly turnover of teacher personnel in
the past few years, with a 5 0/o turnover as the highest for any one
year.
Austin Public Schools include 12 elementary schools, k-6, with ten of them located in the city, while two are located in rural communities within six miles from the city proper. The buildings range from quite old with some additions to very new and modern in all respects. All the schools are under the same administration, and follow the same basic curriculum as is required by the state. The elementary branch is administered directly by a Director of Elementary Education, who in turn is supported by principals in each of the various buildings. New teachers to the system are generally allowed to choose from the existing vacancies, and older teachers to the system are allowed to move to other positions as vacancies appear if they so desire.

Many elementary teachers are hired during the summer months to work on or develop special projects, or gather materials for selected curriculum areas felt in need of improvement by the administration, or desired by the teaching faculty.

As in this study, the problem of departmentalization versus the self-contained classroom is an important issue, and experimentation in both forms is being carried out in various elementary grades and in various curriculum areas. It is noteworthy that this study is being made in conjunction with one experiment being carried on.

This study was restricted to the community of Austin, Minnesota, considered in many ways as a typical midwestern city, but unique in others. A single industrial core basically supports its wealth, and affords the majority of the population with an above average income due to the profit sharing plan designed by the Hormel Company. Because of the relatively high income of the labor force in Austin, slum areas are lacking, and the
school system enjoys many facilities and well qualified personnel due to the high local tax base supporting the school. Experimentation in educational procedures is encouraged by the administration, and is carried on in selected areas of the curriculum each year. An experiment in departmentalization in grade six is being carried on at the time of this writing and this investigation was made in conjunction with that experiment. The procedures of the investigation are discussed next.

Procedure of Investigation

Particular details in the procedure of this investigation are vital to its final conclusions. Those details are discussed to clarify the exact plan as it was carried out.

To carry out this study, it was necessary to determine which of many measuring devices should be used to evaluate departmentalization in its relation to pupil achievement, and yet not conflict with the daily processes of education. The final decision was made by the Director of Elementary Education, since the experiment involved the time and efforts of many teachers and students. The Metropolitan Achievement Test, Form B, was chosen as the device for measurement for various reasons, some of these being: (1) A desire to use one achievement test, administered at the beginning of the school year, and repeated in its alternate, form CM, to the same sixth grade pupils at the end of the same school year, so that a direct comparison could be made of pupil scores receiving instruction in departmental and self-contained class situations, to see which form of organization best supported achievement growth. (2) The Metropolitan Achievement Test, Form B, is considered a reliable and valid
test in Austin and has been used in all the elementary schools at least once each year in the past five years for measuring purposes. (3) The teachers involved were familiar with the administering procedures through past experience and were less apt to make errors in administering and correcting the tests. (4) Testing in the above described manner made it possible to carry out this investigation by comparing the fall scores of all students in grade six in the areas of English, math and science, with the scores made by the same pupils in the spring tests, and thus, the amount of achievement growth could be compared between students in the self-contained groups with those in the departmentalized groups.

In September, 1963, the Metropolitan Achievement Test, Form B, was administered to all sixth graders in the entire school system on the same dates. The tests were administered according to the instructions provided by the company by all teachers involved. Each homeroom teacher scored the tests of his group, and forwarded the entire test to the author for further investigation. The raw scores made by each pupil in the areas of English, math and science were recorded on individual cards, sorted into groups by schools, and kept for later comparison following the spring testing. After eight months of required classroom teaching by all sixth grade teachers, the Metropolitan Achievement Test, alternate Form CM, was again repeated in the exact manner described above, and the raw scores were added to each individual card for comparison purposes, the results of which will be discussed in the following chapter.

The author interviewed the principal of each building of the 12 elementary schools to determine the exact teaching procedures being carried out in each sixth grade in the system. Two schools having three
sixth grade groups each, were found to be utilizing the departmentalized organization in the areas of English, mathematics and science. These two schools became the experimental group for this investigation. Four more schools were found to be involved in other experiments such as the ungraded classroom and were disqualified from this study. Six remaining schools were found to be utilizing the straight self-contained classroom organization in all sixth grades, and so became the control group for this study.

In evaluating the teachers used in this experiment, it was found that the range of experience varied in both groups, men and women were employed in both groups, and since all were offered contracts for the following school year, it was assumed for purposes of this study, that all were competent teachers.

In previous years, all elementary grades were of the self-contained type, but through mutual agreement among the sixth grade teachers in each building, the type of organization to be used was determined at the beginning of the year. Those teachers choosing the departmental organization chose their specific teaching area in English, mathematics, or science through personal interest and agreement.

In all schools, basic tests were used in all areas supplied by the school system, and access to supplementary materials was equally available. The units of study were basic to all schools so that the material taught during the time between tests was similar in content and followed the Minnesota course of study for grade six.

The procedures of this investigation developed largely through the experimental atmosphere which exists in the Austin schools. The testing instrument was determined by the Director of Elementary Education for
various reasons, and the use of that test provided the author with the information needed for this study. The experimental group in departmentalization was determined through the desire of teachers to experiment with departmental teaching, while the control group was determined through the desire of other teachers to teach a self-contained class. The pupils scores following the first Metropolitan test were recorded, and after eight months of routine classroom teaching, were again tested by the alternate test used for the first scores, with these scores being recorded for comparison purposes. The difference between the two scores made by each pupil indicated the amount of achievement growth made by each pupil throughout the year in the areas tested. Individual scores were then sorted into groups, and the experimental groups scores were compared with the control group scores, to determine the effects of departmentalization on sixth grade students in the areas of English, math and science. An attempt was made to remove as many as possible of the factors that may have influenced the final conclusions of this study.

Summary

In this section, an attempt has been made to portray the community, the school and the people of Austin, Minnesota, so that the reader might become familiar with some of the factors which may have influenced the conclusions of this study. The city of Austin was described as having an industrial core, a higher than average income for labor and a progressive school system. Austin has 12 elementary schools, with eight of them being used in this study. The fact that this experiment was carried out with the aid of the administration and the faculty indicates that experimentation
is encouraged. The measuring device for this study was selected by the director of Elementary Education in Austin for various reasons. The Metropolitan Achievement Test, Form B, was given to all pupils in the fall on the same dates, and repeated in its alternate form in the spring of the same year following normal teaching procedures. The individual scores recorded following the fall achievement tests in the areas of English, mathematics and science by each pupil were compared with the scores each made on the spring achievement tests in the same areas, and the amount of gain or loss was indicated for further analysis. These scores were then grouped into control and experimental, a mean gain for each major group was established and compared to determine the effects of departmentalization on sixth grade in the areas of English, mathematics and science. The analysis and comparisons of these scores are discussed next.
CHAPTER IV

ANALYSIS AND COMPARISON OF ACHIEVEMENT TEST SCORES IN THE AREAS OF ENGLISH, MATHEMATICS AND SCIENCE

In this section, the achievement test scores of students in the experimental group and control group in the areas of English, mathematics, and science are analyzed and compared.

Due to the limitations on this study explained in a previous section, the total number of pupils used for this study was 400. Since the experimental and control groups were divided by schools based on the form of classroom organization being utilized, a total of 164 pupils made up the experimental group, while the remaining 236 pupils made up the control group.

The procedures carried out in preparation for the analysis and comparison section of this paper was to make individual pupil cards, including the pupil's name, school, teacher and the results in raw scores made by the pupil in the fall and spring Metropolitan Achievement Test, Form B, and its alternate, Form CM. The scores of each pupil in each subject area were then subtracted to indicate the amount of gain or loss that had taken place throughout the school year in the areas of English, mathematics and science. Next, the cards were sorted into experimental or control groups. The resulting scores indicated on the cards in each major group were then used to determine the mean gains in the various areas for both experimental and control groups. The mean gains were tested for a significant difference between the means
of the two major groups by computing a Z statistic. Since the alternate or major hypothesis predicted direction, the test was one-tailed. The results of these comparisons are discussed by subject area.

English

The raw scores arrived at for each pupil through the use of the Metropolitan Achievement Test, Form B, and its alternate, Form CM, used in this study, is a composite score including three parts, language usage, parts of speech, and punctuation and capitalization.

\[ S_x = \frac{S_X}{\sqrt{N}} \]

\[ S_{Dx} = \sqrt{S_{x1}^2 + S_{x2}^2 - 2 (r)(S_{x1})(S_{x2})} \]

\[ Z = \frac{\bar{X} - \bar{Y}}{S_{Dx}} \]

where

- \( S_x \) = standard error of the mean
- \( N \) = number in samples
- \( \bar{Z} \) = Z statistic
- \( S_{x1} \) = the standard errors of the difference between the two means, the difference of which is being tested
- \( S_{x2} \) = the standard errors of the difference between the two means, the difference of which is being tested
- \( r \) = reliability coefficients of .89 English, .90 math, .89 science
- \( \bar{X}, \bar{Y} \) = mean gain, experimental control groups

In order to determine the effects of departmentalization in English as compared to the effects of a self-contained classroom organization, a comparison of the mean gains was carried out. The null hypothesis tested was that there would be no significant difference between the two groups except that expected by chance. In an analysis of the mean gains, it was found that the experimental group had made a mean gain of 22.15, while the control group made a mean gain of 20.23. The mean difference of 1.92 in favor of the experimental group was tested by means of a Z statistic\(^2\) and found to be 9.89. By reference to the proper tables it was found that this score was significant beyond the .01 % level. Therefore, the null hypothesis of no difference was rejected and the alternate hypothesis that the experimental group would achieve a significantly higher score in the area of English than would the control group was accepted.

Mathematics

The Metropolitan Achievement Test, Form B, and its alternate, Form CM, tests two areas included in mathematics achievement at the sixth grade level, Arithmetic Computation and Arithmetic Problem-solving and Concepts. The raw scores were averaged together for each pupil tested, so that a single score could be computed to measure gains and losses for each pupil. After grouping individual scores into experimental and control groups, a comparison of the mean gains was made to determine the effects of departmentalization as compared to the self-contained classroom organization. The null hypothesis tested was that there would be no

\(^2\)Ibid., p. 21.
significant difference between the two groups except that expected by chance. The experimental group made a mean gain of 13.10, whereas the control group made a mean gain of 11.23. The mean difference of 1.87 was established in favor of the experimental group. The Z score was computed and found to be 13.35. By reference to the proper tables it was found that this score was significant beyond the .01 % level. Therefore, the null hypothesis of no difference was rejected and the alternate hypothesis that the experimental group would achieve a significantly higher score in the area of mathematics than would the control group was accepted.

Science

The science section of the Metropolitan Achievement Test, Form B, and its alternate Form CM, is a 55 item test, measuring information, generalizations and understandings most commonly covered in grade six science programs. In order to determine the effects of a departmentalized classroom as compared to the self-contained classroom organization, a comparison of mean gains was carried out. The null hypothesis tested was that there would be no significant difference between the two groups except that expected by chance. In an analysis of the mean gain made by each group it was found that the experimental group made a mean gain of 20.22, whereas the control group made a mean gain of 20.41. The mean difference was established as being -.19. Since the mean difference was

\[ \text{Ibid., p. 21.} \]
negative the Z score\(^4\) of -.95 was negative. Reference to the proper tables indicated that this was significant at the 17% level. Therefore, the null hypothesis of no difference between the groups was accepted.

Summary

In this section, an analysis and comparison of achievement test scores in the areas of English, mathematics and science made by 400 sixth grade students is reported. The students were divided into an experimental group and a control group according to what type of classroom organization was being utilized in their particular school. The students were tested at the beginning of the school year and again at the end of the same school year by the Metropolitan Achievement Test, Form B, and its alternate, Form CM. A null hypothesis that there was no significant difference between groups except that expected by chance was stated. Next, a comparison in the areas of English, mathematics and science was made by testing the null hypothesis for a significant difference between the means of the two major groups by computing a Z statistic. The final results in the areas of English and mathematics indicated that the null hypothesis of no significant difference was rejected and the alternate hypothesis that the experimental group would achieve a significantly higher score in the areas of English and mathematics was accepted. In the area of science however, the null hypothesis of no significant difference was accepted.

\(^4\text{Ibid.}, \ p. \ 21.\)
CHAPTER V
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Organization for the best learning situation is a problem to be considered by all persons involved in elementary education. There have been various attempts in the past to improve the learning situation in the elementary grades due to a common feeling among many educators that the self-contained classroom organization does not meet modern needs.

Many studies have been carried out testing the worth of departmentalization in certain areas, but little conclusive evidence has been cited proving it to be a superior form of elementary organization. Authors supporting the self-contained classroom organization make similar claims to substantiate their theories. Because there is a lack of experimental evidence concerning the problem, this study was made in an attempt to provide such evidence.

The problem dealt with in this research was to determine whether pupil achievement at the sixth grade level would be increased in a departmental organization as compared to the self-contained classroom organization covering the same units of study, as indicated by standardized achievement tests. The hypothesis held was that gains in achievement by the departmental classes would be greater at the end of a one school year period than would be shown by the self-contained classes in the areas of English, mathematics and science.

The procedures followed to complete this study included a review of the literature to discover what facts had been established by previous research in this area. It was discovered that departmentalization was one
of our earliest forms of organization, dating back to colonial times. Further research indicated that although departmentalization appeared in American elementary schools periodically through our history, it has disappeared in the main during the last few decades. Because there seemed to be no existing information explaining the reason, this study became essential in an attempt to provide evidence supporting or rejecting the use of departmentalization in elementary school.

Further procedures carried out in this study involved the setting of limitations. The area chosen for study was Austin, Minnesota, primarily because departmentalization was being experimented with in some of the 12 elementary schools located in that city. Other limitations involved choosing the three areas of English, mathematics and science to be tested, defining the teachers of the experimental groups to be volunteers by subject interest rather than having specialized training in the areas surveyed. The period of research covered one school year and involved 400 pupils remaining in each specific school during the test period, and the measurement of pupil achievement was confined to the Metropolitan Achievement Test, Form B, and its alternate, Form CM, which was administered at the beginning of the school year and repeated at the end of the same school year.

Specific characteristics of this study involved detailed information concerning the city of Austin and certain factors concerning the public school system there. The city of Austin has a population of some 30,000 people, the majority of whom depend largely on the Hormel Meat Packing industry in some way. Due to the unique form of profit sharing by the employees, a higher than average income is enjoyed by the majority
of the population. Because of this fact, a higher tax base is provided for use by the schools, and thus, a stable faculty of less than 5% yearly turnover is maintained, and better than average facilities are provided. The elementary school administration encourages experimentation with new ideas, and this study was made in conjunction with one experiment being carried on.

The findings of this study involved the computing of the amount of gain made by the experimental group and the control group in achievement in the selected areas at the end of the school year. The mean gains of each group were then compared, and a mean difference in each area was established. The mean difference was tested by use of a Z statistic in each area, and through the use of the proper tables, the null hypothesis of no significant difference between the groups except that expected by chance was rejected in the areas of English and mathematics since the scores were significant beyond the .01% level. In the area of science the null hypothesis was accepted since reference to the proper tables indicated that the mean difference between groups was significant at the 17% level.

Conclusions

The conclusions drawn by the author as a result of this study are as follows:

1. Departmental classroom organization provides for increased pupil achievement to a higher degree than is provided for in the self-contained classroom organization.

2. The departmentalized classroom is a superior form of organization as compared to the self-contained classroom.
3. Elementary teachers trained in general teaching procedures and allowed to teach specific areas of interests and abilities in departmentalized classes, provide for better pupil achievement than do elementary teachers similarly trained but teach all areas of the self-contained classroom.

Recommendations

The following recommendations concerning the conclusions drawn from this study are suggested:

1. Further research in other areas of the elementary curriculum and at other grade levels based on the departmental classroom organization.

2. Extended exploration in the area of science through the use of a specialized test to more closely compare all the components making up a modern science program.

3. Elementary teachers should be encouraged to pursue areas of interest and ability so that they may specialize in the teaching of said areas at the elementary level.

4. Teacher training institutions, communities, school administrators and teachers should look at our present form of self-contained classroom organization and weigh its potential in view of the claims made by authors presenting research information supporting and defending the departmental organization.
Ackerlund, George, "Some Teacher Views on the Self-Contained Classroom," 


