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Achievement scores and perceived self-concept of sixth grade students in heterogeneous and homogeneous groups

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ACHIEVEMENT SCORES AND PERCEIVED SELF-CONCEPT OF SIXTH GRADE STUDENTS IN HETEROGENEOUS AND HOMOGENEOUS GROUPS

MASTER'S PROJECT

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DEDICATION

This study is dedicated to my husband

who has given me great support

and encouragement for completing my master's.

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CHAPTER I

INTRODUCTION

Purpose of Study

Teachers are often challenged to find the most effective and efficient way to teach 25-30 students of varying ability. Many educators, with the belief that it is easier to target instruction to a smaller range of abilities, often decide to group students according to ability (Hereford,1993). Although there are numerous studies showing no positive effects of ability grouping, Robert Slavin estimates that 88-90 percent of public schools in the United States do some ability grouping or tacking of students (Shell, 1994). For the past 60 years, educators have debated the issue of ability grouping, which was first reported being used in 1867 in St. Louis, Missouri (Manning, L., 1990).

The opponents of ability grouping are supported by great amounts of research findings. Ellen Ruppell Shell, an associate professor of journalism at Boston University, is an opponent of tracking, the practice of grouping students to classes based on their overall intelligence and performance. She claims that "tracking becomes an institutional framework for self-fulfilling prophecy,"(Shell, 1994). In other words, students placed in

high ability classes are expected to achieve more and usually do while students in low ability classes are expected to achieve less and usually do. Anne Wheelock, author of "Crossing the Tracks: How 'Untracking' can save America's Schools," adds that students usually become trapped in a group where they remain their entire school career. (Instructor, 1995). Opponents agree that high ability groups are exposed to more material, read independently more, have more opportunities to do projects, and are challenged with high order questions more. Students in the low ability group, however, spend more time on rote learning, oral reading in a group, and complete fewer high order thinking activities (Shell, 1994).

Despite the numerous research findings, there are advocates for ability grouping as well. Sally M. Reis, an educational psychologist at the University of Connecticut, believes that students with higher ability need to be challenged in a way that does not occur when these students are in a heterogeneous group (1994). Educators also believe they can support and reinforce the learning of students in low ability groups better than when they have to balance the activities of a heterogeneous classroom.

Because there is still wide spread controversy about the practice of grouping students by ability in schools, this study conducted a survey of sixth grade students in one public school district. One sample of students were ability grouped for math; the other sample of students were in a heterogeneous group for math. The study established the perceived self-concepts of both samples. The study also examined the math scores on the Ohio Sixth grade Proficiency Tests of the sixth grade students. Then the study determined if a relationship existed between the student's perceived self-concept and the

student's math score on the Ohio Sixth grade Proficiency Tests. The relationship between the homogeneous group's and the heterogeneous group's self-concept and math scores were also studied.

Problem Statement

The controversy over ability grouping often deals with academic achievement. In addition, the controversy includes the question of the affects of ability grouping on a student's self concept and attitude. Proponents of ability grouping say that students with lower ability have a lower self-concept when they have to compete with high-ability students in a heterogeneous group. "Therefore, ability grouping should improve the self-concepts of low-ability learners," (Manning, L., 1990). Opponents of ability grouping, however, believe that students with average or low ability have an even lower self concept when placed in an ability group (Young, 1990). This study examined both the academic achievement in math and the student's perceived self-concept in relationship to students who were in an ability group and those who were in a heterogeneous group. The following questions were answered.

1. What is the mean math score from the Ohio Sixth grade Proficiency Tests for students who are in the following groups for math:

- a high ability group?
- an average ability group?
- a low ability group?
- a mixed ability group?

2. What is the difference in the mean math scores from the Ohio Sixth grade Proficiency Tests between students in the following two groups for math:

- a homogeneous group?
- a heterogeneous group?

3. What is the perceived level of self-concept of sixth grade students who are in the following groups for math:

- a high ability group?
- an average ability group?
- a low ability group?
- a mixed ability group?

4. What is the difference in the perceived level of self-concept between students in the following two groups for math:

- a homogeneous group?
- a heterogeneous group?

5. What is the relationship between the math scores from the Ohio Sixth grade Proficiency Tests and the perceived self-concept of students who are in the following two groups for math:

- a homogeneous group?
- a heterogeneous group?

Need for Study

There is widespread controversy over the issue of ability grouping. Opponents argue that ability grouping harms self-esteem and only fosters low order thinking in low ability groups (Barko, 1996 & Shell, 1994). Advocates, on the other hand, argue that kids with higher ability are held back and not encouraged to reach their full potential in heterogeneous groups (Reis, 1994 & Gallagher, 1993). In addition, a 1994 survey conducted by the Public Agenda Foundation found that only 34 percent of Americans believe heterogeneous grouping increases student achievement (Barko, 1996).

Students in the fifth and sixth grade at one of the four elementary buildings in this study are grouped by ability for math instruction. Students in the other buildings are not grouped by ability. Not all of the sixth grade teachers are in agreement about ability grouping. Some believe that ability grouping is the best way to increase academic achievement. Others believe that there is no significant difference in academic achievement with ability grouping but do believe that it is harmful to the self-concepts of students in the low or middle groups. With such controversy, there needed to be further study of students' academic achievement and self-concept in regard to being in an homogeneous group or being in a heterogeneous group.

Definitions

Ability Grouping - grouping students for instructional activities by ability or achievement to create the greatest amount of homogeneity among learners (Slavin, 1987).

Heterogeneous Group - consisting of dissimilar ingredients or constituents: mixed (Merriam Webster Dictionary, 1994).

Homogeneous Group - of the same or a similar kind (Merriam Webster Dictionary, 1994).

Math Scores - A sixth grade level of mathematical literacy and competency requires understanding of concepts, recall of basic mathematical facts, performance of mathematical procedures, and application of concepts and skills to problem solving situations. A student's raw score represents outcomes on patterns, relations and functions, problem-solving strategies, numbers and number relations, geometry, algebra, measurement estimation, and mental computation, data analysis and probability. Raw scores are converted to scaled scores so that scores from one annual form of the test can be compared to another. A scaled score of 200 remains the level of minimum proficiency for Mathematics. A scaled score of 250 remains the level of minimum advanced performance (Ohio Department of Education, 1997).

Ohio Sixth Grade Proficiency Tests - The Ohio Revised Code requires the State Board of Education to establish a statewide program to measure student proficiency in Writing, Reading, Mathematics, Citizenship, and Science (Ohio Department of Education, 1997).

Self-concept - all the descriptions an individual attaches to himself/ herself (Borba, 1989).

Tracking - assigning students to classes based on their overall intelligence and performance to create homogenous groups so that students spend all or most of the day with peers of the same ability (Hereford, 1993).

Limitations

One limitation to the study was the low number of participants. Only 77 out of 183 sixth grade students participated in the study. Low response was due to the end of the school year time constraints.

Another possible limitation is that there were six different teachers involved in teaching math to the sixth grade students. Three teachers grouped students by ability whereas the other three taught to a heterogeneous group. The difference in teaching styles and the difference in methods of teaching were limitations considered in this study.

Finally, the results of this study were only generalized to the students in the sixth grade during the school year 1996-1997 that attended the urban school in the study.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

Many educators disagree on the effects of ability grouping. They question whether it helps some students more than it hurts other students. They wonder if it is ethical to implement such a practice if it is not meant to benefit all students. According to Slavin and Braddock (1993), there are two differing views on ability grouping. He claims that advocates of ability grouping look only at the effectiveness of it. Opponents of ability grouping, on the other hand, are more concerned with equity for students and democratic values. Because of these contradictory views, there needs to be more research on the effects of ability grouping.

This review of literature will look at the arguments for both sides of ability grouping. This chapter will explain findings on the effects of ability grouping on achievement tests. It will also review studies on the argument of ability grouping on school equity which may effect a student's self-concept.

Achievement Test Scores and Ability Grouping

Well known for his studies conducted on ability grouping, Slavin (1987) has produced evidence that ability grouping is ineffective. Slavin and Braddock (1993) also conducted a national longitudinal study that measured outcomes of students in tracked schools and compared them to outcomes of students in untracked schools. The results demonstrated that "students in the low track performed significantly less well on achievement tests (reading, mathematics, science, and social studies) than did similar low achievers in untracked schools" (p. 12). The study also concluded that ability grouping provided no benefit for average and high achievers. In Gamoran's (1992) review of literature, she sited a study conducted by Fogelman (1983) and Kerckhoff (1986) that included 9000 students in secondary schools over a five-year period. They found that average scores on standardized tests of math and reading achievement were very similar for students in ability groups as compared to students not in ability groups. However, when they compared students of similar ability, they found that "high-group students performed better than similar students in ungrouped schools, but low-group students did worse" (Gamoran, p. 12).

Oakes (1995) adds to the argument against ability grouping with her results from a study in San Jose that looked at gains in math achievement over three years. The results showed that students of all different abilities placed in higher-level courses made greater gains than those placed in lower-level courses. Moreover, Dawson (1987) provided evidence that ability grouping could actually reduce achievement for students with average or low ability.

Although Slavin (1987) has given evidence that ability grouping has zero effect overall on academic achievement, he does say that ability grouping for specific skills or for a specific subject tends to be more effective for more students. Advocates for ability grouping define ability grouping as such, dividing students for particular subjects. They argue that those who oppose tracking, the practice of separating students for all academic subjects (having an academic, general, and vocational track) oppose ability grouping for its similarity to tracking. Moreover, most advocates for ability grouping make their arguments when considering what they call the unnurtured, gifted students in heterogeneous classrooms.

Disagreeing with Slavin's findings of the zero effect, Fiedler, Lange, and Winebrenner (1994) claim that Slavin "omitted data from students in the top five percent from his study (p.54). Omitting data from the top students would not allow research to show that ability grouping had positive effects on brighter students.

Another argument of advocates for ability grouping is against the use of standardized achievement tests to show academic improvement. Gallagher (1993) says that gifted students are going to perform at the top level of achievement tests regardless of being grouped homogeneously. Therefore, achievement tests do not show the academic gains by bright students grouped homogeneously because the students have already reached the highest possible scores on the tests (Fiedler et al.,1994, Gallagher, 1993). However, Gallagher claims when gifted students are grouped heterogeneously, they may learn the least.

Reis (1994) supports Gallagher by discussing what happens in a heterogeneous classroom. One of her findings was "that more than eighty percent of the time, high ability students received the same kind of instruction, of the same material, as the rest of the class" (p. 40). Reis criticized the unchallenging and low level textbooks that are being used for 75-90% of instructional material. Furthermore, she found that 40-50% of the repetitious academic material in reading, math, social studies, and spelling could be eliminated each year for bright students without affecting their achievement scores. In other words, gifted students are not challenged to think beyond their level of knowledge (Reis, 1994, Fiedler et al., 1994, Gallagher, 1993). They are not taught how to learn, how to problem solve, and how to use study skills.

Gallagher (1993) believes that the effectiveness of heterogeneous groups should be measured by comparing students internationally. He reviewed one such study that compared first and fifth grade students from the United States to students from Taiwan and Japan. Among the top 100 scores in math, 15 of the first grade students were from the U.S. and only one of the fifth grade students was from the U.S. To compete with top students from other countries, top students in the United States need to be grouped in order to receive a challenging education that accelerates their learning.

Effects of Ability Grouping

When opponents of ability grouping aren't discussing statistical findings on the effects of ability grouping, they are arguing about the inequity they say grouping creates.

They criticize ability grouping for causing segregation and for not providing equal access to knowledge, which in turn harms the self-concept and attitudes of students.

Oakes (1995) states that studies show there are no set methods for grouping students. Some schools use IQ scores, past performance, or even behavior as a prediction for achievement. Because methods tend to be rather subjective, segregation occurs. A study in San Jose found that eighth grade "Latino students with average scores in mathematics, were three times less likely than whites with the same scores to be placed in an accelerated math course" (Oakes, 1995, p. 686). Hereford (1993) reviewed Braddock's study that included 14,000 eighth grade students. He found that Asian and white students were in high and middle groups more than Hispanic, Black, or Native American students. Oftentimes, students with behavior problems also get assigned to the low group (Oakes, 1995, Cusick, 1993).

Having students with behavior problems in one group can create some of the criticisms of instruction in low-ability classes. Teachers spend more time on behavior management and less on instruction (Gamoran, 1992, Oakes, 1995). In addition, Gamoran states that teachers for low ability groups have lower expectations of the students and require less work from them. On the other hand, teachers working with high-ability groups demonstrate more enthusiasm and use more preparation time for instruction.

Instruction tends to be distinctly different from the low group to the high group. Students in low groups work alone more often than in groups (Oakes, 1995, O'Neil, 1992). Students are exposed to less curriculum (Oakes, 1995) at a lower pace (Slavin and

Braddock, 1993) and are required to only use lower level thinking skills (Young, 1990). Gamoran (1992) found that students in the low group spend much more time completing worksheets and on repetitious activities. Students in high groups, on the other hand, spend more time with hands-on activities and are required to do more critical thinking (Oakes, 1995, O'Neil, 1992). Thus, low ability groups are criticized for not providing the same learning experiences and resources as the high groups (Oakes, O'Neil, Wheelock).

Causing segregation and providing unequal access to learning are two ways ability grouping could affect the self-concept and attitudes of students. Young (1990) states that students with average and low ability have a lower self-concept when grouped by ability. Manning reviewed Dawson's findings that students in low groups have lower self-concepts and attitudes. Moreover, students in high groups had inflated self-concepts that Dawson claims were artificial. Using data from 297 classrooms in 25 junior and senior high schools, Oakes (1995) found that students in average and low ability groups have lower self-esteem, participate less in after school activities and have a higher drop-out rate, regardless of socioeconomic status. Hastings (1992) argues that doing away with ability grouping is a moral imperative. He states that all people are created equal under law and therefore should receive equal opportunity to learn and gain experience.

Responding to the remarks that ability grouping causes segregation inside classrooms, Gallagher (1993) says that a disproportionate number of minorities in gifted programs is not a result of ability grouping. In fact, he claims that variables such as motivation, experience, or practice play a role in determining the numbers. Gallagher adds that when a student practices skills, that student will out-perform another student

with equal ability who does not practice. He claims certain minority groups do not practice academic skills as often as others. Therefore, students from certain minority groups have fewer representatives in the high ability groups. Fiedler et al. (1994) suggests that achievement tests should not be the only factor determining placement in groups. To avoid discrimination, different methods of studying student behavior should also be used. He believes potential students for the high group should have a positive attitude toward school and learning.

Advocates for ability grouping disagree with opponents' views that students in low and average groups do not receive equal opportunities in learning. Fiedler et al. (1994) states that "equality in education does not require that all students have exactly the same experiences" (p.55). Instead, each group should receive an education that helps all reach their given potential. Nevi (1987) adds that grouping should provide more structure and the teacher should be better able to provide rich experiences for students in low groups. Yet, when grouping, all educators must believe that all groups have potential of "acquiring high-status knowledge" (p.275) which is described as the "combination of skills, experiences, attitudes, and academic content needed to create an informed and productive member of society" (p. 274).

Many opponents of ability grouping suggest that teachers implement cooperative learning to account for individual differences within the classroom. Reis (1994) believes that placing a gifted student in small groups and expecting them to be the teacher in the group is harmful to that student. She says some can not always explain concepts to others; and furthermore, acting as teachers does not challenge the student appropriately.

Finally, heterogeneous groups lower self-esteem of less able students because they are always compared to more able students (Fiedler et al., 1994). More able students could also become arrogant when they out-perform most of the students in their class. Creating homogeneous groups would eliminate such detrimental effects because students would be compared to others of similar ability, a more accurate comparison.

In Nevi's (1987) review of Kulik's study, he found that students tended to enjoy school subjects more when they were grouped with others of similar ability. In addition, some students' attitudes toward school and themselves improved after being in a grouped class. Kemp and Watkins (1995) stated that students in high ability groups actually have lower self-esteem than students with similar ability in a heterogeneous group. They believe students in high groups would not feel so elite because the competition would be greater.

Relationship of Self-Concept and Academic Achievement

In a longitudinal study by Helmke and van Aken (1995), 697 students were involved to find the relationship between self-concept and academic achievement. They wanted to see if an improvement in self-concept would increase a student's achievement or if improved achievement improved a student's self-concept. The research found that an increase in academic achievement improved self-concept. That would mean that the better one thought he performed, the better he would feel about himself.

CHAPTER III

METHODOLOGY

Population and Sample

The population for this study consisted of 183 sixth-grade students enrolled in a small urban school in Midwest Ohio in the 1996-1997 school year. The sixth grade students attended one of the four elementary schools in the district. Out of the 183 sixth-grade students, 77 students were included in the study. Forty of those students were in a homogeneous group during the math instruction, and 37 students were in a heterogeneous group during math instruction.

This study included only those subjects who met the following criteria:

1. Students who returned signed permission slips from home, giving the researcher permission to use the math scores from the Ohio Sixth-grade Proficiency Tests.
2. Students who took the Ohio Sixth-grade Proficiency Tests in March 1997.

3. Students who were not exempted by an IEP to take the Ohio Sixth- grade Proficiency Tests.
4. Students who attended the same math class for the entire 1996-1997 school year.

Design

The design for this study is descriptive research.

Data and Instrumentation

The instrument used to collect data on math achievement of sixth-grade students is the Ohio Sixth-grade Proficiency Tests. "Results from these proficiency tests will be used to demonstrate the proficiency level of literacy and basic competency as well as the advanced level of proficiency," (Ohio Department of Education, 1997). To ensure the validity of the tests, the tests measure outcomes approved by the State Board of Education. A system converts raw scores to scaled scores for the tests. "Scaled scores represent approximately equal units on a continuous scale;" therefore, "differences between students' scaled scores represent the same amount of difference wherever they occur on the scale," (Ohio Department of Education, 1997). A minimum level of proficiency in mathematics is a scaled score of 200. A scaled score of 250 is the level of minimum advanced performance.

In May 1997, the researcher sent home permission slips with all sixth-grade students who took the proficiency tests and were not exempt. Signed and returned slips granted the researcher permission to use the math scores as data for the research. The researcher then went to the director of instruction at the school to obtain a copy of the

math scores, which arrived in June, 1997. The researcher coded the scores appropriately as to whether each student was in a heterogeneous or a homogeneous group for math. If the student was in a homogeneous group, the level of the group the student was in was recorded. The groups were high, average, or low.

To collect data for perceived self-concept of sixth-grade students, the researcher created a self-concept survey using a five point Likert scale. Several self-concept surveys were combined and modified and some new questions were added to make a survey of twenty questions. The Likert scale included the following representations: 5=always true, four =often true, three =sometimes true, two =seldom true, one =never true.

A correlational analysis on the self-concept scale was run at the University of Dayton in the Computer Data Assisted Laboratory in June, 1997. The analysis found the self-concept scale to have a reliability of .9.

In May, 1997, the sixth-grade teachers asked their students who were participating to fill out the self- concept survey during math class. The surveys were coded so that the researcher could match each student's survey with his or her math score.

Data Analysis

All of the data was put on a spread sheet and then transferred to a computer at the Computer Data Assisted Laboratories at the University of Dayton. Descriptive statistics were used to summarize the proficiency test scores in math and to summarize the perceived self-concept of the students. T-tests were used to show the difference between students in a heterogeneous group versus a homogeneous group for math for both

variables. Pearson's Product Moment Correlation Coefficient was used to show the relationship of math scores and self-concept. Analysis of Variance (ANOVA) was used to compare ability groups on the variables, math scores and self-concept.

CHAPTER IV

RESULTS

TABLE 1

HOMOGENEOUSLY GROUPED STUDENTS' MATH SCORES ON THE OHIO SIXTH GRADE PROFICIENCY TESTS

Math Score	n	%
250 and up: Advanced proficiency	1	3
249-200: Minimum proficiency	19	47
199 and below: Below proficiency	20	50
Total	40	100

Table 1 gives the number and percentage of students who have advanced math scores, proficient math scores, or below proficient math scores. About half of the homogeneously grouped students had advanced or proficient math scores. The other 50 percent had math scores below the proficient level.

TABLE 2

HETEROGENEOUSLY GROUPED STUDENTS' MATH SCORES ON THE OHIO SIXTH GRADE PROFICIENCY TESTS

Math Score	n	%
250 and up: Advanced proficiency	4	10
249-200: Minimum proficiency	25	68
199-below: Below proficiency	8	22
Total	37	100

Table 2 shows the number and percentage of students in heterogeneous groups who have advanced, proficient, or below proficient math scores. Over 75 percent of the students scores in the proficient or advanced math range. The remaining 22 percent had scores below proficiency.

TABLE 3

MEAN MATH SCORE FROM OHIO SIXTH GRADE PROFICIENCY TESTS OF STUDENTS IN A HETEROGENEOUS GROUP

n	Mean
37	217

Table 3 shows that the mean math score for the heterogeneous group is above the minimum level of proficiency (200) in Mathematics.

TABLE 4

MEAN MATH SCORES FROM OHIO SIXTH GRADE PROFICIENCY TESTS OF STUDENTS IN A HOMOGENEOUS GROUP

High Group		Average Group		Low Group	
n	mean	n	mean	n	mean
17	191	15	218	8	163

In Table 4, the mean math scores for the high, average, and low ability groups is shown. The average group had the highest mean (218) which was above the minimum level of proficiency (200) in Mathematics. The high group had the next highest mean (191), followed by the low group's mean of 163. Both the high and the low group's means were below the minimum level of proficiency.

TABLE 5

DIFFERENCES BETWEEN HOMOGENEOUS AND HETEROGENEOUS GROUPS OF STUDENTS PROFICIENCY TEST SCORES

t	DF	Probability	Significant
-3.61	75	.001	*

* < .05

Table 5 shows that when a T-test was run, a significant difference was found between the heterogeneous and homogeneous groups of students on their Ohio Sixth-grade Proficiency Tests' math scores. The mean score (196) of the homogeneous group of students was significantly lower than the heterogeneous group's mean score (217).

TABLE 6

STUDENTS' LEVEL OF PERCEIVED SELF-CONCEPT
AS A MATH STUDENT

Score		n	%
100 - 85	Always True	37	48
84 - 69	Often True	33	43
68 - 53	Sometimes True	6	8
52 - 37	Seldom True	0	0
36 - 20	Never True	1	1
Total		77	100

mean = 89 median = 88 mode = 84 SD = 6.02

Table 6 shows the students' level of perceived self-concept. Almost half (48%) of the students indicated "always true" about the constructs of self-concept; 43 percent showed "often true" on the self-concept scale; 8 percent indicated "sometimes true" on the constructs of self-concept. The remaining one percent indicated "never true" on the self-concept scale. As a g roup, students perceived the self-concept constructs as "always true" (mean = 89) to them.

TABLE 7

PERCEIVED SELF-CONCEPT LEVELS OF SIXTH GRADE STUDENTS IN A HETEROGENEOUS GROUP

n	mean
37	82

When answering questions about self-concept as a learner, students in the heterogeneous group had a mean score of 82 out of 100 possible points. As a group, they answered "often true" to the constructs of the self-concept scale.

TABLE 8

PERCEIVED SELF-CONCEPT LEVELS OF SIXTH GRADE STUDENTS IN A HOMOGENEOUS GROUP

High Group		Average Group		Low Group	
n	mean	n	mean	n	mean
17	79	15	81	8	89

Table 8 demonstrates that the low ability group had the highest mean score (89) when answering questions about self-concept. The low group indicated "always true" to the constructs of the self-concept instrument. The average group with a mean of 81 and the high group with a mean of 79 answered "often true" to the constructs of the self-concept scale.

TABLE 9

DIFFERENCES BETWEEN HETEROGENEOUS AND HOMOGENEOUS GROUPS OF STUDENTS' PERCEIVED SELF-CONCEPT

t	DF	Probability	Significant
-0.08	65	0.94	NS

When a T-test was run, no significant difference was found on students' perceived levels of self-concept between heterogeneous and homogeneous groups.

TABLE 10

CORRELATION BETWEEN PERCEIVED SELF-CONCEPTS AND PROFICIENCY TESTS MATH SCORES FOR STUDENTS IN HETEROGENEOUS GROUPS

	Math Scores
Self-concept	.46
	(37)

Table 10 shows that when a Pearson's Product Moment Correlation was run, a moderate relationship was shown (.46).

TABLE 11

CORRELATION BETWEEN PERCEIVED SELF-CONCEPTS AND PROFICIENCY TESTS MATH SCORES OF STUDENTS IN HOMOGENEOUS GROUPS

	Math Scores
Self-concept	.82*
	(40)

Table 11 reveals that when a Pearson's Product Moment Correlation was run, a significant, positive, high relationship was established (.82).

CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS, RECOMMENDATIONS

Problem Statement

The controversy over ability grouping often deals with academic achievement. In addition, the controversy includes the question of the affects of ability grouping on a student's self concept and attitude. Proponents of ability grouping say that students with lower ability have a lower self-concept when they have to compete with high-ability students in a heterogeneous group. "Therefore, ability grouping should improve the self-concepts of low-ability learners," (Manning, L., 1990). Opponents of ability grouping, however, believe that students with average or low ability have an even lower self concept when placed in an ability group (Young, 1990). This study examined both the academic achievement in math and the student's perceived self-concept in relationship to students who were in an ability group and those who were in a heterogeneous group. The following questions were answered.

1.What is the mean math score from the Ohio Sixth grade Proficiency Tests for students who are in the following groups for math:

- a high ability group?

- an average ability group?

- a low ability group?

- a mixed ability group?

2. What is the difference in the mean math scores from the Ohio Sixth grade Proficiency Tests between students in the following two groups for math:

- a homogeneous group?

- a heterogeneous group?

3. What is the perceived level of self-concept of sixth grade students who are in the following groups for math:

- a high ability group?

- an average ability group?

- a low ability group?

- a mixed ability group?

4. What is the difference in the perceived level of self-concept between students in the following two groups for math:

- a homogeneous group?

- a heterogeneous group?

5. What is the relationship between the math scores from the Ohio Sixth grade Proficiency Tests and the perceived self-concept of students who are in the following two groups for math:

- a homogeneous group?
- a heterogeneous group?

Summary

The related literature mentioned that advocates for ability grouping believed students with high ability should not be held back by being kept in heterogeneous groups. However, the study showed that the mean math score from the Ohio Sixth grade Proficiency Tests was the highest for the homogeneous group of average ability students and the heterogeneous group of students. The mean math score for those two groups were above the level of minimum proficiency for Mathematics. The homogeneous group of high ability students had the next highest mean math score, followed by the group of low ability students. Both the high and low ability groups scored below the level of minimum proficiency for Mathematics. Overall, however, the heterogeneous group of students scored a significantly higher mean math score than the three homogeneous groups of students when combined.

Opponents of ability grouping often argue that ability grouping can harm a student's self-esteem, especially when put in the low group. The results from the study were just the opposite. The homogeneous group of low ability students had the highest mean score of the perceived level of self-concept. The mean scores of perceived self-

concept were lower for the other three groups: the high ability group, the low ability group, and the mixed ability group. Those groups had similar mean scores. When combining the homogeneous groups of students (high, average, low) and comparing them with the heterogeneous group of students, there was no significant difference between the perceived level of self-concept.

The related literature stated that prior achievement had a positive impact on self-concept. In other words, the more a student achieves, the better the student feels about himself/herself. The literature also stated that the opposite was not true. A better self-concept does not help a student achieve more. From the study, however, a positive, high relationship was found between the perceived level of self-concept and the math score from the Ohio Sixth grade Proficiency Tests in homogeneously grouped students. A higher level of self-concept did appear to help students achieve more. In the heterogeneous group, a moderate relationship was shown. Self-concept of heterogeneously grouped students was a factor for achieving more, but it was not as influential as with the homogeneously grouped students.

Conclusions

More than 75 percent of the students from the heterogeneous group had proficient or advanced proficient math scores on the Ohio Sixth grade Proficiency Tests.

Only half of the students from the homogeneous group had proficient or advanced proficient math scores on the Ohio Sixth grade Proficiency Tests.

The mean math score of the heterogeneous group was higher than the mean math score of the homogeneous group. Out of the high, average, and low ability groups, the average ability group had the highest mean math score. Perceived self-concept levels were similar in both the homogeneous and heterogeneous groups. Ninety percent of the students answered often true or always true to the constructs of self-concept. Out of the three ability groups, the low group had the highest mean score of perceived self-concept.

Implications

1. Heterogeneous grouping is more effective at producing proficient math scores on the Ohio Sixth grade Proficiency Tests.
2. Because the average ability group performed better than the high and low groups, the average group may have received more challenging instruction.
3. The test used to separate students into groups may not be a reliable predictor of ability since students in the average group scored higher than students in the high group. Different teaching styles and the type of instruction for the different groups could have affected the math scores and self-concept levels.

No matter who they had as a math teacher, students felt good about themselves as math students. Students were comfortable with their teachers.

The low ability group must have felt comfortable being with peers of similar ability since they had a higher level of self-concept.

The teacher of the low ability group may have focused more on self-esteem building than the other teachers.

Recommendations

1. Group heterogeneously for sixth grade math.
2. Pace instruction of math towards higher ability students so they will not be held back; but average and low ability students will benefit from the exposure to the material.
3. Research the methods of the teachers of the heterogeneous groups to find effective ways of raising achievement levels.

APPENDICES

APPENDIX A

May 14, 1997 CORRESPONDENCE

Dear Parent:

I am an intervention teacher at West Elementary and am currently doing research to earn my Master's Degree in Education. As a part of my study, I am asking sixth grade students in the district to complete a survey about how they feel as a learner. In addition, I would like permission to view your child's math scores from the Ohio Proficiency Tests. I will access the scores from the school office. Both the survey and the math scores will be coded so that the information is confidential. No names will be used, and no scores will be singled out.

Your child's participation would help my study be a success.

If you agree to allow your child to participate in my study, please sign and return the bottom of this letter to your child's homeroom teacher as soon as possible.

Thank you,

Sharon Armstrong

Yes, I give my child permission to complete the learner survey.
Yes, I give Sharon Armstrong permission to view _____'s
(your child's name)
Ohio Proficiency Tests math scores.

_____
Parent signature date

APPENDIX B
INSTRUMENT

Directions:

Please read each statement. Next to each statement is a set of numbers 1-5. Please circle a number for each statement. There are no right or wrong answers to these questions. Answer the way you really feel about each statement.

	Always True	*Often True*	*Sometimes True*	*Seldom True*	*Never True*
1. I get my math work done on time.	5	4	3	2	1
2. I do well on math tests.	5	4	3	2	1
3. I am eager to go to math class.	5	4	3	2	1
4. I'm proud of my math work.	5	4	3	2	1
5. I'm doing the best work that I can in math.	5	4	3	2	1
6. I like to be called on in math class.	5	4	3	2	1
7. I'm doing as well in math as I'd like to.	5	4	3	2	1
8. I think math is important to learn.	5	4	3	2	1
9. I don't get discouraged in math class.	5	4	3	2	1
10. I like math work.	5	4	3	2	1
11. I think my math teacher likes me.	5	4	3	2	1
12. I stay out of trouble in math class.	5	4	3	2	1
13. Math is easy for me.	5	4	3	2	1
14. I have a good time in math.	5	4	3	2	1
15. I find it easy to participate in math class.	5	4	3	2	1
16. It is easy for me to pay attention to the math teacher.	5	4	3	2	1
17. I fix mistakes on my math work without getting upset.	5	4	3	2	1
18. I think I can solve math word problems as well as other sixth grade students.	5	4	3	2	1
19. My teacher makes me feel I'm a good math student.	5	4	3	2	1
20. I don't get upset when the math teacher asks me to do something.	5	4	3	2	1

Circle the name of your math teacher:

Falkner Moorman Petrie Lhamon Jacobs Hollman

CODE: #_____

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ABSTRACT

ARMSTRONG, SHARON E.

ACHIEVEMENT SCORES AND PERCEIVED SELF-CONCEPT OF SIXTH GRADERS IN HETEROGENEOUS AND HOMOGENEOUS GROUPS, (pp 42), June 1997

Faculty Advisor: Calvin F. Dill, Ph.D.

PROBLEM: The controversy over ability grouping often deals with academic achievement and the effects of ability grouping on a student's self concept. The purpose of this study was to determine if sixth grade students in a heterogeneous math class performed better than sixth grade students in a homogeneous math class on the Ohio Sixth grade Proficiency Math Test. It also determined if there was a difference in perceived self concepts between the heterogeneous and homogeneous math groups.

PROCEDURES: A review of research findings on the effects of ability grouping on achievement tests and self concept was completed. Descriptive statistics were used to summarize the proficiency test scores in math and the perceived self concept of the students. T-tests were used to show the difference between the heterogeneous and homogeneous groups for both variables. Pearson's Product Moment Correlation Coefficient was used to show the relationship of math scores and self concept. Analysis of Variance (ANOVA) was used to compare ability groups on the variables, math scores and self concept.

FINDINGS: The study found a significant difference between the heterogeneous and homogeneous groups of students on their math scores. The mean score (217) of the heterogeneous group was significantly higher than the mean score (196) of the homogeneous group. No significant difference, however, was found between the two groups on students' perceived self concept.

CONCLUSIONS AND RECOMMENDATIONS: The heterogeneous group of students had a higher mean on the Ohio Sixth grade Proficiency Tests math score than the homogeneous group. There was little difference between the two group's perceived self concepts. The argument for ability grouping to increase achievement scores was not supported by the findings in this study. Because this study found that the homogeneous group had a much lower mean math score than the heterogeneous group, the school in the study should not group students by ability for math.