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The Relationship Between Student Time-On-Task and Student Achievement in the Lyons-Decatur Northeast School District

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THE RELATIONSHIP BETWEEN STUDENT TIME-ON-TASK AND STUDENT ACHIEVEMENT IN THE LYONS-DECATUR NORTHEAST SCHOOL DISTRICT

Presented to the

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at Omaha

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of the Requirements for the Degree

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by

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PROPOSED FIELD PROJECT ACCEPTANCE

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Friend John Forsberg

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CHAPTER 1

INTRODUCTION

Learning is produced in a context of many variables. For generations, educators have sought to identify the complex of variables that make for academic success. Among the variables that contribute to student learning are, the quality of instruction, the relationship of the student to others in the social environment, and the skills of the people responsible for instruction. (Frederick & Walberg, 1980). Invariably one of the additional variables operating is time, time spent in homework on a lesson, during a school year, or in a lifetime of schooling. The other variables may have their effects, other things being equal, to the extent that they are given time to work. (p. 193)

Time variables such as 1) time devoted to instruction, 2) amount of time students actually spend trying to learn, 3) how teachers use time, 4) length of school year or day, and 5) time needed by students to learn have special significance because they, unlike many other significant educational variables are viewed as manipulatable facets of school and classroom life. Although time factors may have relatively small impacts on

achievement compared to other factors such as family background, they are very significant in a practical way because time is a resource that educators can control (at least in principle). (Karweit, 1982)

Although time-on-task (amount of time students actually spend trying to learn) may not be the only time variable of interest, recent studies of time and learning have focused exclusively on time-on-task. In part, this interest in student time-on-task reflects an awareness of the difficulties inherent in detecting effects for such global time measures as days in the school year and hours in the school day. It also reflects a very strong conviction that the amount of time students engage in learning must be an important predicator of the amount of learning which occurs. For example, Wiley & Harnischfeger (1974) stated it is inconceivable that more schooling, other relevant variables being considered, will not produce more learning. John Goodlad (1984) cites in his book A Place Called School the time children and youths spend in school appears to affect rather directly the amount of their learning as measured by tests. Results from other studies have concluded that the amount of student time-on-task is highly predictive of the learning achievement of the student. (Bloom, 1974; Seifert & Beck, 1978; Strother, 1984.)

In 1984 the Nebraska Eighty-Eighth Legislative-Second Session enacted Legislature Bill 994 which mandates the school year shall mean (a) for elementary grades, the time equivalent to at least one thousand thirty-two instructional hours and (b) for high school grades the time equivalent to at least one thousand eighty instructional hours. (Legislature of Nebraska Eighty-Eighth Legislature - Second Session, 1984, p. 5) On August 1, 1985, LB994 replaced Rule 15, sections 002.10 and 002.12. 002.10 defines school day as a minimum of five clock hours of instruction with both students and teachers in attendance. 002.12 defines school year as school open and in session with pupils in attendance not less that 175 days. (Rule 15, 1985, p. 5). LB994 increases the minimum number of elementary instructional hours to one hundred fifty seven, and two hundred five instructional hours for the high schools in Nebraska.

But, there are dissenting views. Frederick & Walberg (1980) reviewing the existing studies of time and learning suggest a rather temperate view of the importance of time: "time devoted to school learning appears to be a modest predicator of achievement." Other studies suggested that the time and learning linkage was conditional (Husen, 1971) or questioned the magnitude of the importance of time factors (Karweit, 1984; Karweit & Slavin, 1981).

Yes, time spent in learning and its relationship to achievement have become topics of considerable research interest (for reviews see Caldwell, Huitt & Graeber, 1982; Frederick & Walberg, 1980).

In summary, time spent is not so consistently related to achievement as it may seem. This generalization suggests that oversimplified policies regarding time are likely to be misguided and produce disappointing results. With this thought in mind, the administrative staff at Lyons-Decatur Northeast has proceeded cautiously when reviewing and considering time factors as avenues enhancing student learning. The central issue should not be the length of the school year or day until it has been determined how much real learning is taking place during the time provided. (Railsback, 1985) It was with this concept in mind that the researcher presented the time-on-task as related to student achievement to the Northeast Board of Education, October, 1985. It was stated that student anonymity would be kept by having the school counselor administer the Otis-Lennon Ability test for aptitude and the classroom teachers administer the pre-post math tests for achievement. The scores were to be handled by the researcher. The researcher was to observe three times each in each first grade and fifth grade to record the percentage of student time-on-task.

The form used by The California Commission for Teacher Preparation and Licensing during their 1972 Beginning Teacher Evaluation Study was to be utilized. The researcher received training in using this observation form at a Chapter I regional workshop held in Kansas City, Missouri, October, 1984. It was also noted the counselor and classroom teachers had given their consent to help partake in this study. The Board of Education felt that this was a reasonable concept to be performed according to the protocol stated.

Time and how it is spent--time-on-tasks--may well be the variable that makes the difference for students. The theory, learning is dependent on the behavior or involvement of the learner, needs to be researched first. (Anderson, 1975) Therefore, the relationship between student time-on-task and student achievement must be tested before pursuing other factors.

Statement of the Problem

The purpose of this study was to test the relationship between student time-on-task and student achievement in the Lyons-Decatur Northeast School District.

Limitations

This research was limited to the first and fifth grade students attending Decatur Elementary in Decatur,

Nebraska and a matched group of first and fifth grade students attending Lyons Elementary in Lyons, Nebraska. These are the two elementary schools in the Lyons-Decatur Northeast School District. The area selected for testing was math.

Assumptions

It is assumed the Otis-Lennon Mental Ability testing instrument (Aptitude) is a valid measurement of abilities.

It is assumed the teacher made test is a reliable instrument to test student achievement.

It is assumed the Student Observation Form from the BTES is a reliable instrument.

Hypothesis

There is no significant difference between student time-on-task and student achievement at Lyons-Decatur Northeast Elementary Schools.

Methodology

To test the hypothesis there is no significant difference between student time-on-task and student achievement the researcher will:

1. Identify matching groups of students in the first and fifth grades. The students will be matched according to the Otis-Lennon Mental Ability Test (Aptitude) administered, according to protocol, by the school counselor to assure student anonymity.

2. Calculate student time-on-task using the Student Observation Form used in the Beginning Teacher Evaluation Study conducted in 1972 by the California Commission for Teacher Preparation and Licensing.

3. Calculate student achievement, assessed by using a teacher made test on a common unit, administered by the classroom teacher according to protocol.

4. Calculate the score on a teacher made pre and post test.

5. Test for relationship between student achievement and time-on-task using a crosstabulation analysis.

6. Test for correlation between student achievement and time-on-task using the Pearson Product-Moment Correlation technique.

Definitions

The term Achievement referred to what the students actually gained. (National School Public Relations Association, 1978, p. 3)

The term Aptitude referred to what the students had the ability to do. (p. 3)

The term Time-On-Task referred to the amount of time students actually worked on any assigned activity that built the desired skill. Time-on-task can be (1) interactive-working in an instructional task with others (e.g., teacher, aide, or other students) or (2) non

interactive-working on an instructional task done alone (e.g., silent reading, working on written assignments). (Hiscox Braverman & Evans, 1982, p. 9)

Organization of the Project

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References

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CHAPTER II

REVIEW OF RELATED LITERATURE

Numerous studies conducted over the last fifty years have examined the effects of time on learning. School time has been taken broadly to include years of schooling, days or hours per school year and time engaged in learning. Not surprisingly, given the broad range of time measures and differences in methodological approaches, studies have produced a fairly wide spectrum of estimates for the effect of time on learning.

As early as 1963, John B. Carroll (1963) noted that the amount of learning that occurs is determined by the match between the time needed for learning and the time actually spent in learning. Carroll explained that the amount of time a student needs in order to learn a given concept is related to five factors: 1) aptitude i.e., the amount of time the pupil will need to learn the task under optimal instructional conditions; 2) ability to understand instruction; 3) perseverance, i.e., the amount of time the learner is willing to engage actively in learning; 4) opportunity to learn, i.e., the amount of time allowed for learning; and 5) quality of instruction, i.e. a measure of the degree to which instruction is presented so that it

will not require additional time for mastery beyond that required in view of aptitude. (Carroll, 1963, p. 729)

Recently much attention has been given to the use of time in school. In 1984 the Nebraska Eighty-Eighth Legislature-Second Session enacted Legislature Bill 994 which mandates the school year shall mean (a) for high school grades the time equivalent to at least one thousand eighty instructional hours. (Legislature of Nebraska Eighty-Eighth Legislature-Second Session, 1984, p. 5) John Goodlad (1984) cites in his book A Place Called School, the time children and youths spend in school appears to affect rather directly the amount of their learning as measured by tests. (p. 96) Increasing annual attendance from 175 to 185 days appears to enhance achievement. (Wiley & Harnischfeger, 1974, p. 9) Instruction sustained year after year enhances achievement and this achievement is affected positively when studies in school are accompanied by homework. (Husen, 1972, April, p. 33) It seems apparent that simply the amount of time spent on a given subject is a powerful factor in learning. (Goodlad, 1984, p. 96)

Professor Husen (1972) has reviewed research findings with respect to the question: Does more schooling produce more achievement? Although he finds some ambiguity in the available data he concludes that an increase in the amount

of schooling will not produce a proportionate increase in achievement. (p. 33)

"The view that time spent is equivalent to learning gained has become the newest myth to cloud our understanding of education," according to Nancy Karweit. (1982) Giving children more time to study does not necessarily mean that they will learn more. How one school or teacher uses time may be very different from the way time is used in another school or classroom--even within the same district. (p. 46)

Charles Railsback (1985) cites lengthening the school day and school year would seem to be worth serious consideration, and some states and localities are in fact moving in that direction. However, the length of the school day or year has not really been the central issue. The more crucial question has been how to assure real honest-to-gosh learning time during whatever length of day or year the local school board decides upon. (Railsback, 1985)

Smith's (1979) study addressed the following problem: Does time allocated for social studies instruction account for variance in student achievement scores? Findings demonstrated a very slight relationship between allocated time and achievement, and when studied in context of other variables, the usefulness of allocated time as a potent

variable in planning or evaluation of instruction seemed questionable. This study reflects the fact that allocated time and achievement are not related.

The most extensive empirical study to focus directly on active learning has been the Beginning Teacher Evaluation Study, begun in 1972 by the California Commission for Teacher Preparation and Licensing. The original purpose of this study was to identify desirable competencies for beginning teachers, but the focus later shifted to identifying teaching activities and learning conditions that foster achievement. The research, conducted in second and fifth-grade classrooms that were staffed by experienced teachers, documented 1) how the school day is actually spent, 2) the extreme variation that exists among classrooms with regard to curricular emphasis, and 3) the relationship between time and learning.

In Phase II of the Beginning Teacher Evaluation Study allocated time was reported for different instructional settings. The relationship between allocated time and student achievement was analyzed for each of these settings and varying findings were obtained for different grade levels and subjects. Phase III B of the study showed that allocated time related in varying degrees to student achievement. (Caldwell, Huitt, Graeber, 1982,

p. 474) This study concluded that time seems to be moderately related to student achievement, with the relationship becoming stronger as the measure of time reflects what students do in the classroom. Measures that reflect certain aspects of the quality of allocated time, such as student engaged time and academic learning time, show the strongest relationship to achievement.

The results of a study by Edward Seifert and John Beck (1978) revealed engaged learning events appeared to be operating optimally when students were listening and thinking. Significant negative correlations were found among "off-task," "waiting for help," and "total unengaged time" when compared with achievement gain.

The relationship of learning time to students' achievement became clear in the seventies when researchers tried to link classroom conditions directly to students' scores on achievement tests. The researchers found that time-on-task is more strongly related to achievement than such factors as classroom arrangement or method of instruction. Thus the more recent studies have attempted to relate various teaching behaviors, classroom organizational patterns, classroom environment, and methods of instruction to students' time-on-task. (Strother, 1984, June, p. 715)

Students at the University of Chicago have been studying the amount of time students spend in active learning. Their studies show that the amount of time the student is spending directly on the learning is highly predictive of the learning achievement of the student. The correlations when corrected for reliability accounted for about three fifths of the achievement variations of students. (Bloom, 1974)

Bloom (1976) summarized a series of studies in which some measure of time-on-task during an instruction period was tested for its relationship to achievement of achievement gain. Five studies in the summary showed a positive correlation between participation and achievement ranging from .21 to .63. Seven other studies in the summary showed correlations ranging from .26 to .87 for time and gain in achievement. The mean correlation for both sets of studies was approximately .49. (Bloom, 1976, p. 5)

Many teachers have assumed that if the students will direct attention toward everything to which the teacher directs the class, the result of that attention will be higher student achievement. That is, pupil-on-task performance has been assumed to correlate positively with student achievement. The results of Bell and Davidson's (1976) study indicate that with pupil intelligence

considered (excluded), the percentage of time which pupils spend in on-task-performance is not consistently correlated with pupil achievement. The existence of significant partial correlations between pupil-on-task-performance and pupil achievement in three of the 23 classes and the existence of specific teacher behaviors in these three classes, which were significantly different from the other 20 classes, indicate that a most important variable in the classroom may be the teacher behaviors which result in the pupil-on-task-performance. Specifically, the most important variable related to student achievement, in the presence of pupil-on-task-performance, may be teacher behaviors. (p. 175-176)

In her article "Questioning Time-on-Task," Cornbleth (1980) states that pupil time-on-task has been conceptualized as a predictor of pupil achievement, a mediator between teacher behavior and pupil achievement, and a behavioral indicator of ongoing pupil learning. Whether pupil time-on-task is conceived as an independent, mediating, or dependent variable, it does seem to be a significant factor in classroom teaching and learning.

Rosenshine's (1976) research uncovered the amount of time spent directly on instruction and content covered was significantly related to achievement, where as time on

nonacademic activities has been negatively related. Student inattention was consistently, significantly, and negatively related to achievement, but the results for student attention on on-task behavior were positive.

Recently, researchers have moved from a primary concern with teacher behaviors to consideration of some student variables. This focus on the student has been influenced by Carroll (1963) and Bloom (1976). Their work represented a major shift in our thinking about research on teaching. Although it still matters whether a teacher is critical, or indirect, or enthusiastic, it is much more relevant to the issue of student achievement to know if the students have been engaged in mastering academic skills and what kind of progress they are making towards the mastery of those skills. (Rosenshine & Berliner, 1978, p. 5)

McNamara (1981) relates a teacher is teaching only when the children are learning and in order to learn children must attend. The notion of attention and the amount of time that children spend engaged on learning tasks has been recognized as an important factor influencing children's learning and methods books have always prescribed the techniques and strategies which beginning teachers must deploy in order to hold their pupils' attention and keep them working.

No one would deny the importance of ensuring that children must pay attention and work at designated tasks if they are to learn--this is one of the commonplaces of classroom life. (p. 293)

The findings of Anderson's (1975) study suggest the importance of time-on-task as a critical and alterable variable in school learning and the parallelism which exists between time-on-task and achievement. Put simply, as students spend a greater percent of their time-on-task, they learn more. Since this is the case, he concludes time-on-task can be viewed as a criterion variable in its own right. (p. 61)

Gettinger's (1984) research concludes the amount of time spent in learning is an important determinant of achievement. However, results from studies examining classroom use of time and achievement are inconsistent and, at best, ambiguous in their implications. The study reveals the importance of spending adequate time in learning, relative to amount needed, in order to maximize achievement. The results suggest the need for attending to both time in learning and amount of time factors when evaluating the relationship between time and learning.

Although research has documented that classrooms differ in how time is allocated and spent, these differences do not appear to be consistently related to

achievement. (Fredrick, 1980) Fredrick and Walberg (1980) have concluded that time spent in learning is only a modest predictor of achievement. Karweit (1982) cites the most interesting finding of the Beginning Teachers Evaluation Study is the connection between time and learning is as small as it is.

Karweit and Slavin (1981) report that the choice of model linking time and learning may be implicated in the inconsistent findings for time-on-task. Because students need differing amounts of time to achieve the same learning goal, inconsistencies in the effect of time spent may reflect this failure to consider differences in time needed. That is, estimating the effects of time spent without considering time needed is one important source of the inconsistent results to data. It is possible that use of nonlinear models might more closely match the real learning curves that underlie the relationship of time to learning, but it is likely that regardless of the statistical model used, time spent being a necessary but not sufficient condition for learning to occur, will be related inconsistently to learning as long as important mediating variables that influence time needed are omitted. (p. 171)

After reviewing this literature, one may assume (1) results from time studies are inconsistent, (2) time seems

to be the main variable studies, (3) time is a manipulatable variable schools can work with and (4) educators have become aware of how young people spend their time can be crucial to their academic success. Therefore, there seems to be enough reasonable doubt about the generalities of the studies and the magnitude of the effects to warrant further research.

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CHAPTER III

METHODOLOGY

The purpose of this study was to test the relationship between student time-on-task and student achievement in the Lyons-Decatur Northeast Elementary Schools. The purpose was reviewed with the Superintendent and Northeast Board of Education at the October and December 1985 school board meetings. (Appendix A) It was stated that mathematics was the discipline selected for the research and the first and fifth grade students would be involved. The procedures were explained as to the gathering of data and the analysis of these data with respect to the stated hypothesis. It was agreed to use gathered data, provided names were not used.

Mathematics was the discipline selected for the study under the assumption that student achievement for the discipline was more likely to show among students than student achievement from several other disciplines. The first and fifth grades were selected because the number of students was reasonable and the time periods available to the researcher coincided with student availability. There were 48 first grade students and 45 fifth grade students involved in this study. By design, fewer students were

considered in the final evaluation (see page 29). Students in the four classrooms were quite similar on many common measures of homogeneity, and they can be considered to be representative of the elementary students in the Lyons-Decatur Northeast Elementary Schools. Special education students were not included in this study.

The duration of the study was seven days for each class. The pretests were administered day one with five teaching days following. During the five teaching days the first grade teacher taught the carry over concept in addition and the fifth grade teacher the concept of simple division with a remainder. On the seventh day a posttest was administered. Students were not allowed to engage in assigned homework during the research time frame, but did assignments as seatwork.

In order to conduct this study, matched groups of students needed to be identified for the purpose of listing and comparing. The first and fifth grade students were grouped according to their scores obtained from the Otis Lennon Mental Ability Test administered, according to protocol, by the school counselor to assure anonymity. Students scoring in the average range of ability were listed, average range being two standard errors from the norm according to the Otis-Lennon Ability Test. Each student was assigned a number (I.D.) by the counselor in

place of their name to assure anonymity.

The first grade testing was conducted in small groups (six or seven) in the counselor's office to eliminate distractions and help students stay on task. It also allowed the counselor to administer the questions to the students' pace. The fifth grade students were administered to on a total class basis in their classroom with time limits adhered to.

The next data analyzed were the number of times students were on-task, as calculated by the researcher. This data was obtained using a student observation form developed by the researcher after reviewing the instrumentation used in the Beginning Teacher Evaluation Study conducted in 1972 by the California Commission for Teacher Preparation and Licensing (Appendix B). The researcher had received training in using this particular form at a Chapter I Regional Conference in Kansas City in 1984. Three observations were scheduled during the five teaching days. The researcher recorded the scheduled observation times on a form used in the BTES (Appendix B). This procedure allowed the researcher to organize and time the observations. The observation time period was 30 minutes in each classroom. All students were recorded in two minute intervals called observation cycles. Fifteen cycles a day were recorded for each student making a total

of 45 cycles for each student. The separate determinations of student behavior made were: a mark I for an engaged interactive action, a N for an engaged noninteractive action, and no mark was made if a student was unengaged (It must be noted, the concept of two different recordings for on-task behavior was made for the researcher's benefit and was not a factor for this study.) The number of on-task cycles was calculated by adding the total number of engaged marks recorded for each student over the three days they were observed.

The third set of data were the results of student achievement, assessed by using teacher made pre and posttests (Appendix B) administered according to protocol, by the classroom teacher to assure anonymity. The tests were created by the four classroom teachers whose combined teaching experience totaled 52 years and it is the researcher's opinion these teachers have exhibited competence in their teaching abilities.

The tests for each grade level consisted of 20 mathematical problems relevant to each grade level's discipline objective (addition in first grade and division in fifth grade). Pre and posttests consisted of different mathematical problems but tested the same skills. The time limit for the test periods was 20 minutes. The classroom teachers recorded the number of correct

responses each student earned from both tests. This information was recorded on a form (Appendix B) prepared by the researcher.

The Student Observation Forms with calculated student time-on-task numbers and the form containing the pre and posttest scores were given to the counselor. The counselor matched these data to each student's identification number and returned the completed statistics to the researcher to be analyzed.

The statistical analysis was conducted by utilizing the SPSS (Statistical Package for the Social Sciences) computer program. The variables entered in the file for each case (student) were: 1) student identification number, 2) number of correct responses on the teacher made pretests, 3) number of correct responses on the teacher made posttests, 4) number of time-on-task cycles, and 5) the grade level of each student. The procedure used to test the hypothesis was a crosstabulation of the posttest scores with the time-on-task cycles. The Pearson Product-Moment Correlation technique was used to describe the relationship between two variables.

This was the researcher's first experience with the SPSS system. The assistance given by Dr. Robert O'Reilly, Educational Administration and Supervision, Dr. Richard Wikoff, Psychology, and Glenda Black, UNO student employed in the computer base program was greatly appreciated.

CHAPTER IV

PRESENTATION OF DATA AND FINDINGS

The purpose of this study was to test the relationship between student time-on-task and student achievement in the Lyons-Decatur Northeast Elementary Schools. The hypothesis stated there was no significant difference between student time-on-task and student achievement at Lyons-Decatur Northeast Elementary schools.

The results of the Otis-Lennon Mental Ability Test revealed 34 first grade students and 35 fifth grade students scoring in the average range of ability. The 69 students with their number of correct responses on the pretest, number of on-task cycles, and grade level provided the variables to form a file (Appendix B) from which a crosstabulation of certain statistics was conducted. The file reflects that 68 students had improvement in their test scores, and one regressed.

Table I represents the number of correct responses recorded on the pretests, the number of students earning that number of correct responses, and the percentages these numbers were of total number of students involved in the study. The data show the number of correct responses on the pretests were 0 to 15. No students had 16 to 20

responses correct. They show 27 students, or approximately 39% didn't have any (0) correct responses. The table also reflects approximately 30% of the students had 5 or less responses correct. This would seem to indicate that prior to this test, the students had little or no knowledge about their respective math concept to be taught during the following five days.

The data recorded on table II represents the number of students earning that number of correct responses and the percentages these numbers were of the total number of students involved in the study. The data reflect the number of correct responses recorded on the posttest varied from 5 to 20, with 20 being the highest number that could be attained. Fourteen students had 20 responses correct and approximately 57% of the students had 15 to 20 responses correct on their posttest. Also, approximately 67% of the student earned 14 to 20 correct responses, thus reflecting the majority of students earning a passing grade (70% representing passing) after 5 days of being taught a given math concept. This may reflect the teacher's ability to present the given math concept in a manner students can comprehend.

Table III illustrates the number of on-task cycles recorded during the observation period, the number of students recorded having that number of on-task cycles,

TABLE I

PRETEST

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	27	39.1	39.1	39.1
	1	5	7.2	7.2	46.4
	2	11	15.9	15.9	62.3
	3	5	7.2	7.2	69.6
	4	5	7.2	7.2	76.8
	5	2	2.9	2.9	79.7
	6	2	2.9	2.9	82.6
	7	1	1.6	1.6	84.1
	8	2	2.9	2.9	87.0
	10	4	5.8	5.8	92.8
	12	1	1.6	1.6	94.2
	13	2	2.9	2.9	97.1
	14	1	1.4	1.4	98.6
	15	1	1.4	1.4	100.0
	TOTAL	69	100.0	100.0	

Note: Table I lists the number of correct responses (value), the number of students having that number of correct responses (frequency), and the percentages the numbers were of the total number of students involved in the study.

TABLE II

POSTTEST

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	5	2	2.9	2.9	2.9
	7	1	1.4	1.4	4.3
	8	2	2.9	2.9	7.2
	9	3	4.3	4.3	11.6
	10	3	4.3	4.3	15.9
	11	2	2.9	2.9	18.8
	12	8	11.6	11.6	30.4
	13	2	2.9	2.9	33.3
	14	7	10.1	10.1	43.5
	15	4	5.8	5.8	49.3
	16	3	4.3	4.3	53.6
	17	8	11.6	11.6	65.2
	18	5	7.2	7.2	72.5
	19	5	7.2	7.2	79.7
	20	14	20.3	20.3	100.0
	TOTAL	69	100.0	100.0	

Note: Table II lists the number of correct responses (value), the number of students having that number of correct responses (frequency), and the percentages the number were of the total number of students involved in the study.

TABLE III

ON TASK

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	31	3	4.3	4.3	4.3
	32	5	7.2	7.2	11.6
	33	3	4.3	4.3	15.9
	34	4	5.8	5.8	21.7
	35	3	4.3	4.3	26.1
	36	9	13.0	13.0	39.1
	37	4	5.8	5.8	44.9
	38	3	4.3	4.3	49.3
	39	5	7.2	7.2	56.5
	40	5	7.2	7.2	63.8
	41	7	10.1	10.1	73.9
	42	6	8.7	8.7	82.6
	43	6	8.7	8.7	91.3
	44	3	4.3	4.3	95.7
	45	3	4.3	4.3	100.0
	TOTAL	69	100.0	100.0	

Note: Table III lists the number of on-task cycles (value), the number of students having that number of on-task cycles (frequency), and the percentages the numbers were of the total number of students involved in the study.

and the percentages these numbers were of the total number of students involved in the study. The least number of on-task cycles recorded was 31 with 45 the maximum (45 cycles represents being on-task 100% of the time observed). Table III indicates all students were on-task a minimum of 69% of the time (31 divided by 45) and approximately 74% of the students were on-task a minimum 80% of the time (36 divided by 45). This seems to reflect teachers' ability to involve students with the lessons.

Tables IV, V, VI are scatter diagrams of the crosstabulations of the posttest scores and the on-task cycles. (Three separate pages were used for clarity purposes. See Appendix B for the entire scatter diagram.) Table IV shows a number of filled cells towards the top portion of the table while there are a number of vacant cells toward the bottom portion. This indicates a number of students recording a low number of correct responses, also had the lowest number of on-task cycles recorded (Example: 2 students earned 5 correct responses with 32 on-task cycles recorded; 1 student earned 7 correct responses, with 31 on-task cycles recorded. One student earned 20 correct responses with 31 on-task cycles recorded.) This was an exception in this study.

Tables V and VI continue to reflect the correlation of the high number of correct responses with the high

TABLE IV

C R O S S T A B U L A T I O N O F

POSTTEST
BY ONTASK

POSTTEST \ ONTASK	31	32	33	34	35	ROW TOTAL
5		2				2 2.9
7	1					1 1.4
8		1			1	2 2.9
9		1		1		3 4.3
10			1			3 4.3
11	1		1			2 2.9
12				2		8 11.6
13					1	2 2.9
14			1		1	7 10.1
15		1				4 5.8
16				1		3 4.3
17						8 11.6
18						5 7.2
19						5 7.2
20	1					14 20.3
COLUMN TOTAL	3 4.3	5 7.2	3 4.3	4 5.8	3 4.3	69 100.0

TABLE V

C R O S S T A B U L A T I O N O F

POSTTEST
BY ONTASK

POSTTEST \ ONTASK	36	37	38	39	40	ROW TOTAL
5						2 2.9
7						1 1.4
8						2 2.9
9	1					3 4.3
10	1					3 4.3
11						2 2.9
12	3			1		8 11.6
13				1		2 2.9
14		1	1	2		7 10.1
15				1	1	4 5.8
16						3 4.3
17	2		1		1	8 11.6
18	1	1	1		1	5 7.2
19						5 7.2
20	1	2			2	14 20.3
COLUMN TOTAL	9 13.0	4 5.8	3 4.3	5 7.2	5 7.2	69 100.0

TABLE VI

C R O S S T A B U L A T I O N O F

POSTTEST
BY ONTASK

POSTTEST / ONTASK (COUNT)	41	42	43	44	45	ROW TOTAL
5						2 2.9
7						1 1.4
8						2 2.9
9						3 4.3
10			1			3 4.3
11						2 2.9
12		2				8 11.6
13						2 2.9
14	1					7 10.1
15	1					4 5.8
16	1		1			3 4.3
17		2		1	1	8 11.6
18	1					5 7.2
19	1	1	1	2		5 7.2
20	2	1	3		2	14 20.3
COLUMN TOTAL	7 10.1	6 8.7	6 8.7	3 4.3	3 4.3	69 100.0

number of on-task cycles. Table VI reflects the opposite findings of Table IV in that most of the vacant cells are at the top portion of the table while the bottom portion of the table reflects the filled cells (Examples: of the 14 students recording 20 correct responses, 8 students had 41 to 45 on-task cycles recorded; of the students receiving 19 correct responses, all 5 had 41 to 45 on-task cycles recorded). The three tables show the lower number of correct responses was associated with a lower number of on-task cycles and the high number of correct responses was associated with a high number of on-task cycles. The correlation coefficient between the time-on-task and posttest scores was .61. This value was above the required .25 at .05 level of significance. Thus, the results signify a positive correlation between the amount of time-on-task and number of correct responses obtained on the posttests.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to test the relationship between student time-on-task and student achievement in the Lyons-Decatur Northeast Elementary Schools. The hypothesis tested was there is no significant difference between student time-on-task and student achievement at Lyons-Decatur Northeast Elementary Schools.

Mathematics was the discipline used for the research and students in the two first and two fifth grade classrooms were involved. The duration of the study was seven days for each classroom (two days for testing and five days for teaching the math concept). The Otis-Lennon Ability test was administered by the counselor to the students to obtain matching groups of students (average range of ability). Thus the data of 69 students was utilized in this study.

The classroom teachers administered the pretest on the first day and the posttest on the seventh day. During the five days between the pre and posttests the classroom teachers taught the match concept relative to grade level

(addition for the first and division for fifth). The researcher observed student time-on-task in each classroom three days out of the five teaching days. On-task recordings were made on a Student Observation Form developed from the instrumentation used in the Beginning Teacher Evaluation Study conducted by the state of California in 1972.

Achievement was measured by the scores made on teacher made tests of the concepts being studied during the five days. The results of the pre and posttests and the student on-task scores were given to the counselor, whom matched this data with the students' identification number. The counselor returned this material to the researcher to be analyzed. This procedure provided student anonymity.

The researcher created a file for the SPSS computer system using the variables: 1) student identification numbers, 2) scores from the pretest, 3) scores from the posttest, 4) number of on-task cycles, and 5) the grade of the students. A crosstabulation was conducted using posttest scores and the on-task cycles of the students. The results provided the researcher with the needed statistics indicating there was a positive correlation between student achievement and student time-on-task. The correlation coefficient score value of .61 was larger than

the required .25 at the level of .05 significance. Therefore, the null hypothesis was rejected.

Conclusion

The results of this study indicate that with student intelligence considered (average range of ability), the amount of time students spend on-task is consistently correlated with student achievement. In analyzing the crosstabulation with student achievement of the posttest scores with the on-task cycles, it is evident that the higher test scores correlated with the higher number of on-task marks recorded. The correlation coefficient score value of .61 indicates a positive relationship between time-on-task and posttest scores. Therefore, the more time students spend on-task the more they will learn. The null hypothesis, there is no significant difference between student time-on-task and student achievement at the Lyons-Decatur Northeast Elementary Schools, is rejected.

It is also concluded that student time-on-task is a critical and alternate variable in school learning and that it can be viewed as a criteria variable in its own right. Trying to improve student time-on-task is clearly a worthwhile objective that schools should pursue.

Recommendations

Based upon the findings of this study, the following

recommendations were made:

1. A similar study be conducted with students at all elementary grade levels to ascertain the relationship of student time-on-task and student achievement.
2. First grade teachers should limit their math periods to a maximum of 25 minutes each due to student attention span.
3. A future study be conducted using other subject areas to determine the relationship of student time-on-task and student achievement.
4. A more in-depth study needs to be conducted to determine the relationship of I.Q. to time-on-task.
5. A more in-depth study needs to be conducted to determine the relationship between teacher interaction to student I.Q. and time-on-task.
6. The majority of the math time should involve interactive time-on-task as compared to non-interactive time-on-task.
7. A similar study needs to be conducted with shorter observation cycles to determine the relationship between time-on-task and student achievement.

8. A future study needs to be conducted using interactive and noninteractive behavior to determine the relationship between time-on-task and student achievement.

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BIBLIOGRAPHY

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APPENDIX A

LYONS — DECATUR NORTHEAST

5th & Crystal - Box 526 Lyons, Nebraska 68038

Lyons Center 687-2363
Decatur Center 349-5382

Norman F. Ridder, Superintendent
Ken Stauss, Secondary Principal - Activities Director
F.J. Forsberg, Elementary Principal - Special Services Director

Virginia Hilkemann, Guidance
Myron R. Schoch, Ass't. Activities Director

To: Dr. O'Reilly, Dr. Sadler, Dr. Kellams;

From: Dr. Norman F. Ridder, Superintendent

Re: Authorization for research project

Mr. Butch Forsberg approached the Northeast School board for permission to research several grade levels at Northeast Schools on the relationship between learning and "time on task" during the October 14th and December 9th school board meetings. Mr. Forsberg asked that this request not appear in the minutes to protect the objectivity of the study. The board was very excited about the study and authorized Mr. Forsberg to use Northeast elementary students at each meeting.

I attest that the above information is true.

Superintendent's Signature

APPENDIX B

PLAN FOR OBSERVATIONS

Teacher _____ Subject: _____Reading Class begins _____

Focus of observation: _____Language Arts Class ends _____

_____Whole class _____Math

_____Instr. group (specify) _____

_____Indiv. students (specify) _____

	Observation Day Date	Observer	Scheduled Observation Time Begin	End	Actual Observation Time Begin	End	No. of Minutes Observed
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							

Comments:

Date ______________ Grade _____ Observation Period __________ __________

NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	A ON-TASK TOTAL	B OBSER-VATION CYCLES	C ENGAGED RATE A÷B

For each observation cycle place an I for engaged interactive or N for engaged noninteractive in the box and leave blank if student is unengaged. Add the total number of engaged marks recorded for each student and enter in Column A. Put the total number of observation cycles for each student in Column B. The engaged rate for each student is then calculated by dividing A by B.

PRE-TEST

Name _____ Date _____

Add:

18 + 7	42 + 8	19 + 3	81 + 9	76 + 5
17 +16	12 +19	14 +18	15 +15	17 +29
34 +27	45 +36	18 +35	23 +27	55 +18
72 +18	38 +35	75 +16	46 +27	58 +33
29 +67	44 +38	26 +25	51 +29	73 +18

POST-TEST

Name _____ Date _____

Add:

15 + 7	18 + 9	65 + 8	34 + 6	57 + 4
13 +18	17 +27	19 +19	16 +15	12 +19
52 +29	17 +35	36 +49	24 +66	73 +18
43 +37	62 +29	57 +34	49 +48	27 +35
25 +65	53 +39	28 +36	58 +23	46 +46

Pre-Test

Name_____ Date_____

$23\overline{)79}$	$31\overline{)75}$	$63\overline{)82}$	$42\overline{)87}$	$18\overline{)81}$
$19\overline{)592}$	$54\overline{)168}$	$62\overline{)861}$	$35\overline{)179}$	$41\overline{)212}$
$72\overline{)1665}$	$69\overline{)7055}$	$12\overline{)4398}$	$29\overline{)6834}$	$56\overline{)8536}$
$12\overline{)13965}$	$72\overline{)21886}$	$38\overline{)26795}$	$82\overline{)25016}$	$52\overline{)24728}$

Post-Test

Name _____ Date _____

$62\overline{)78}$	$34\overline{)97}$	$22\overline{)91}$	$13\overline{)33}$	$47\overline{)96}$
$32\overline{)487}$	$54\overline{)341}$	$73\overline{)525}$	$17\overline{)365}$	$66\overline{)215}$
$53\overline{)3412}$	$64\overline{)2566}$	$27\overline{)3828}$	$93\overline{)2148}$	$49\overline{)3688}$
$67\overline{)41833}$	$12\overline{)10466}$	$43\overline{)41222}$	$26\overline{)17861}$	$96\overline{)24621}$

eacher ______________________ Grade ____ Subject ____________

Student Name	Date ________ Pre-Test Score	Date ________ Post-Test Score	+ Gain - Loss

I.D.	Pre Test	Post Test	On Task	Gr.
1	0	20	43	1
2	2	12	36	1
3	0	17	42	1
4	2	20	43	1
5	5	20	40	1
6	1	14	35	1
7	4	20	31	1
8	0	13	40	1
9	1	20	45	1
10	4	19	43	1
11	0	10	36	1
12	0	20	41	1
13	1	18	41	1
14	0	19	44	1
15	0	12	36	1
16	2	19	42	1
17	0	20	42	1
18	0	20	40	1
19	0	14	37	1
20	0	17	38	1
21	3	20	41	1
22	3	20	37	1
23	1	12	36	1
24	0	20	27	1
25	4	20	43	1
26	3	20	36	1
27	0	13	35	1
28	0	14	33	1
29	0	14	38	1
30	0	17	44	1
31	0	20	45	1
32	0	18	37	1
33	0	17	45	1
34	2	17	36	1

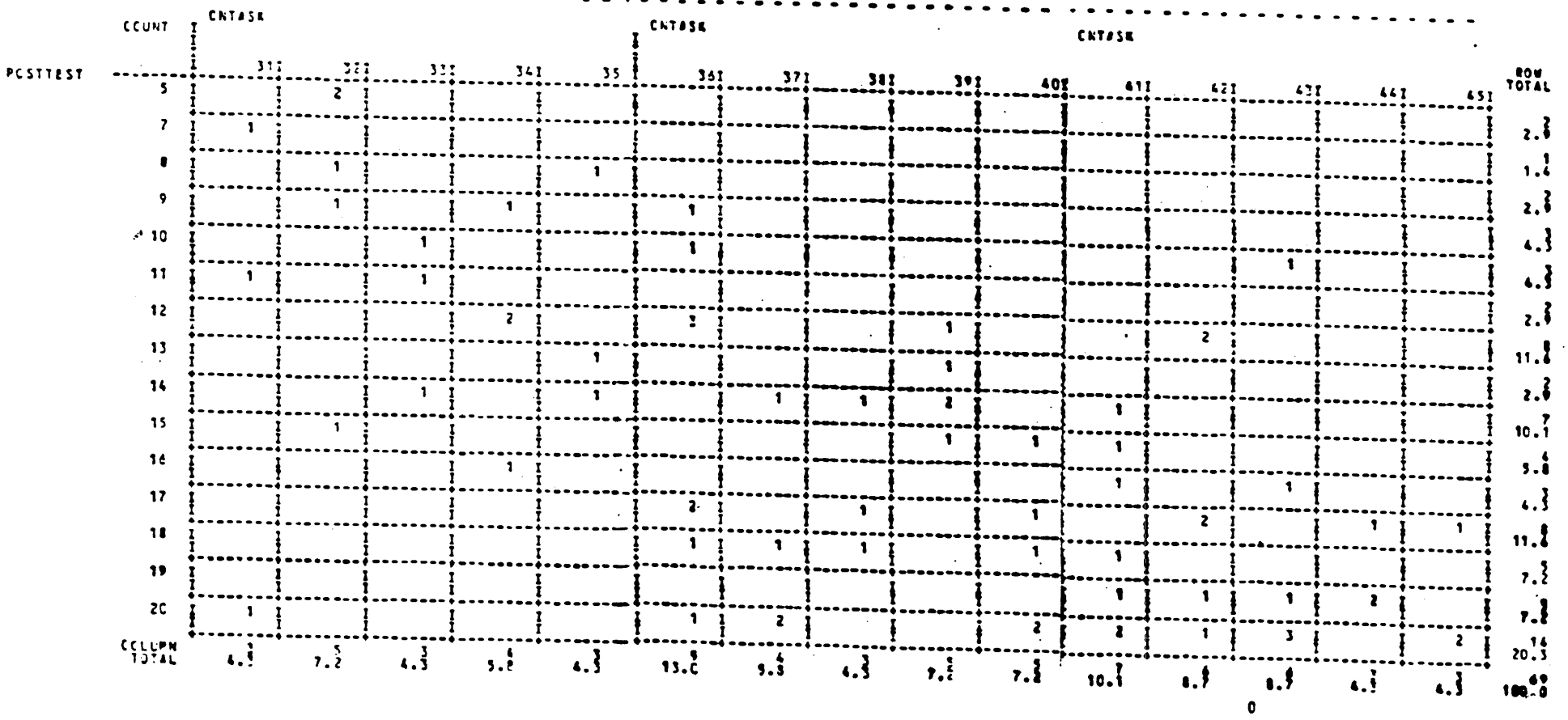
FIRST GRADE FILE

I.D.	Pre Test	Post Test	On Task	Gr.
1	10	12	39	5
2	15	14	41	5
3	3	9	34	5
4	0	10	43	5
5	1	3	32	5
6	14	17	42	5
7	4	15	40	5
8	0	9	32	5
9	2	11	33	5
10	2	10	33	5
11	2	15	39	5
12	10	17	36	5
13	5	11	31	5
14	0	12	42	5
15	0	15	41	5
16	0	8	35	5
17	2	14	39	5
18	13	19	44	5
19	0	14	39	5
20	6	9	36	5
21	6	17	40	5
22	10	15	32	5
23	0	12	34	5
24	7	19	41	5
25	0	16	43	5
26	8	18	36	5
27	4	16	41	5
28	12	13	39	5
29	10	7	31	5
30	3	5	32	5
31	3	12	42	5
32	8	12	34	5
33	13	18	38	5
34	2	16	24	5
35	2	5	32	5

FIFTH GRADE FILE

CROSSTABULATION OF --- CROSSTABULATION OF --- CROSSTABULATION OF ---

PCSTTEST
BY CNTASK



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