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Allocated time allotments and student academic achievement in Ohio elementary schools

Moore, Robert Lee, Ph.D.
The Ohio State University, 1988
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UMI
ALLOCATED TIME ALLOTMENTS AND STUDENT ACADEMIC
ACHIEVEMENT IN OHIO ELEMENTARY SCHOOLS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Robert Lee Moore, B.S., M.Ed.

******

The Ohio State University
1988

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DEDICATION

To my wife, Mary, and my son, Robby, for their support and patience during difficult times.
ACKNOWLEDGEMENTS

Dr. Roy Larmee, in remembrance of his ability to motivate advisees to achieve their full potential, I am grateful for the advice and counsel he gave me.

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Dr. Franklin B. Walter, his patience and understanding gave me the time needed to complete this project.

Dr. Frank Reis and others for moral support during this project.
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FIELDS OF STUDY

Major Field: Educational Administration
TABLE OF CONTENTS

DEDICATION ........................................... ii
ACKNOWLEDGEMENTS ................................ . . .  iii
VITA .................................................. iv
LIST OF TABLES ..................................... vii

CHAPTER PAGE

I. INTRODUCTION .................................... 1
   Introduction ..................................... 1
   Review of the Literature ....................... 4
   Academic Learning Time ....................... 4
   Time On-Task .................................... 6
   Allocated Time .................................. 8
   Purpose of the Study ........................... 11
   Research Questions ............................. 12
   Research Methodology ......................... 13
   Sample Selection ............................... 13
   Instrumentation ............................... 13
   Administration ............................... 14
   Statistical Procedure ......................... 14
   Limitations of the Study ..................... 15
   Significance of the Study .................... 16
   Footnotes ....................................... 17

II. REVIEW OF THE LITERATURE ..................... 19
   Teacher Behavior ............................... 19
   Seatwork ........................................ 23
   Individualized Instruction .................... 25
   Summary ........................................ 26
   Student Behaviors Affect on Academic
      Achievement .................................. 27
   Misbehavior .................................... 28
   Absenteeism .................................... 30
   Interruptions .................................. 31
   Recommended Time Allocation .................. 33
   Summary ........................................ 34
   Footnotes ....................................... 36
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>III. RESEARCH METHODOLOGY</td>
<td>37</td>
</tr>
<tr>
<td>Introduction</td>
<td>37</td>
</tr>
<tr>
<td>Sample</td>
<td>37</td>
</tr>
<tr>
<td>Instrumentation</td>
<td>39</td>
</tr>
<tr>
<td>Administration</td>
<td>41</td>
</tr>
<tr>
<td>Treatment of Data</td>
<td>42</td>
</tr>
<tr>
<td>Footnotes</td>
<td>47</td>
</tr>
<tr>
<td>IV. PRESENTATION OF FINDINGS AND ANALYSIS OF DATA</td>
<td>48</td>
</tr>
<tr>
<td>Demographic Data</td>
<td>49</td>
</tr>
<tr>
<td>Time Allotment</td>
<td>53</td>
</tr>
<tr>
<td>Achievement</td>
<td>58</td>
</tr>
<tr>
<td>Research Questions</td>
<td>60</td>
</tr>
<tr>
<td>Summary</td>
<td>65</td>
</tr>
<tr>
<td>Footnotes</td>
<td>67</td>
</tr>
<tr>
<td>V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS</td>
<td>68</td>
</tr>
<tr>
<td>Introduction</td>
<td>68</td>
</tr>
<tr>
<td>Summary</td>
<td>68</td>
</tr>
<tr>
<td>Conclusions and Discussion</td>
<td>71</td>
</tr>
<tr>
<td>Implications and Recommendations</td>
<td>78</td>
</tr>
<tr>
<td>Footnotes</td>
<td>82</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>83</td>
</tr>
<tr>
<td>APPENDICES</td>
<td></td>
</tr>
<tr>
<td>A. State Minimum Standards</td>
<td>88</td>
</tr>
<tr>
<td>B. List of Sample Schools</td>
<td>91</td>
</tr>
<tr>
<td>C. Questionnaire</td>
<td>104</td>
</tr>
<tr>
<td>D. Letters to Participants</td>
<td>108</td>
</tr>
<tr>
<td>TABLE</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>1.</td>
<td>Distribution of Sample Elementary Schools by Community Population</td>
</tr>
<tr>
<td>2.</td>
<td>Distribution of Sample Elementary Schools by Pupil Population</td>
</tr>
<tr>
<td>3.</td>
<td>Distribution of Sample Elementary Schools by Class Size in Fourth Grade Classes</td>
</tr>
<tr>
<td>4.</td>
<td>Distribution of Sample Elementary Schools by Length of Instructional Day in Fourth Grade Classes</td>
</tr>
<tr>
<td>5.</td>
<td>Distribution of Sample Elementary Schools by Length of School Year</td>
</tr>
<tr>
<td>6.</td>
<td>Mean, Standard Deviation, and Range of Ohio Allocated Time by Subject Area</td>
</tr>
<tr>
<td>7.</td>
<td>Pupil Academic Achievement Data by Normal Curve Equivalent (NCE) Score on the Iowa Test of Basic Skills</td>
</tr>
<tr>
<td>8.</td>
<td>Mean Scores, Standard Deviation and Pearson Correlation of Allocated Time and NCE Pupil Achievement</td>
</tr>
<tr>
<td>9.</td>
<td>Percent of Ohio Allocated Time Spent in Academic and Non-academic Subjects</td>
</tr>
<tr>
<td>10.</td>
<td>Relationship Between Ohio Allocated Time and Recommended Times of Experts</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION

Introduction

Educators continue to be concerned with the process of teaching and learning. In an attempt to understand better how classroom methodology affects pupil academic achievement, education researchers are concentrating their efforts on identifying classroom conditions and teaching activities which produce positive pupil academic performance. Observation of the classroom behavior of both teachers and pupils is a method researchers utilize for discovering strategies which produce the desired level of pupil performance.

One variable identified as having a significant impact on the achievement of pupils is the amount of time they are involved actively in the learning process. The amount of time students spend in the learning process is influenced by decision-makers at various levels of the education hierarchy. At the State Department level in Ohio, minimum standards are mandated by action of the State Board of Education. Included in the standards is a required amount of time students are expected to be engaged in various subjects. Generally, the minimum standard required time allows considerable discretion at the local district level concerning which subject areas will
receive a given allocation of instructional time. Ohio standards require a minimum of 1,100 minutes per week to be allocated at each elementary grade level for planned instruction in English/language arts, health, mathematics, reading, science, and social studies. Foreign language instruction may be included in the 1,100 minutes (1983 Ohio State Minimum Standards). Local boards of education, utilizing the discretion permitted in the minimum standards, allocate amounts of time to courses of study for each area. Some may elect to apply a substantial portion of the required 1,100 minutes to reading and mathematics instruction, while others may choose to allocate a substantial amount of time to social studies and foreign language. The variation in time allocations is usually influenced by the perceptions of the local board and school administrators concerning what the community feels is important to be taught.

The board of education, with input from administrators, teachers, parents, and other members of the community, makes policy decisions concerning educational programs that require trade-offs which affect learning time. One such policy decision occurs when the board determines whether to concentrate on mastery of subject matter or coverage of all curricular materials. If the decision is made to concentrate on the mastery of specific subject matter and not on covering a large amount of material, principals will then set class time to allow for considerable teach - reteach strategies. In a
school where there is a concentration on mastery of specific subject matter, there is an inclination to focus on basic subjects such as reading, mathematics, and science. It is in this type of school district that we find curricular approaches such as mastery learning and direct instruction—two curricular approaches which allow students to progress only after the skill areas of each level are mastered, and not simply because the material has been covered.

Building administrators, using the guidelines of the local board, generate class schedules with specific time allotments for each subject. The principal's schedule normally is expected to reflect the board's policy in the subject areas. Usually discretion is allowed the principal to match available staff to the educational program. First, principals assign teachers to groups of students and determine the amount of time which must be spent on each area of the curriculum. Second, principals determine whether students who need remedial instruction will receive that instruction in pull-out programs where affected students are removed from their regular class and given remedial instruction by a specialist, or if class sizes will be reduced to allow the regular classroom teacher to provide the remedial instruction. Principals usually make these decisions based on the classroom space available in the building, and the number of classroom instructors allotted to the school.
At the classroom level, individual teachers make decisions about how the scheduled class time will be used to teach the required material. The teachers usually take into account the ability of the student in the class, and the ability of the teacher to address their individual differences.

It is the discretionary authority described above that appears to create the disparity in learning time found among school districts and individual classrooms, which may affect significantly the amount of instruction that individual students or groups of students receive.

Review of the Literature

Generally, researchers investigating the disparity in learning time have concentrated in three areas: (1) academic learning time studies of individual students and the amount of time they require to comprehend a specific body of knowledge; (2) time-on-task studies, which include time utilization of classroom teachers in relation to the amount of time pupils are engaged in academic instruction; and (3) allocated time studies which focus on the opportunity for learning or the actual amount of time scheduled for learning a specific subject.

Academic Learning Time

Researchers investigating academic learning time emphasize that class time must be on the right task at an appropriate level of difficulty for each student (Carroll, 1963;
Harnischfeger and Wiley, 1974). Carroll published *A Model of School Learning* which proved to be a catalyst for subsequent research in the area of time and achievement. The model is explained by a mathematical formula which indicates that the degree of learning determined by the amount of time needed to learn. Carroll defined time needed to learn as a combination of a student's aptitude and ability, and the quality of instruction that is provided.

According to Carroll's theory, the amount of time actually spent on learning depends on the perseverance of the student, and the opportunity or time the teacher allows for learning a given task. Harnischfeger and Wiley expanded Carroll's model, and developed a comprehensive model for the classroom teaching/learning process. The model assumes the total amount of learning time on a particular instructional topic is the most important determinant of pupil achievement in that topic. The model begins with quantity of schooling, as defined by policies, and ends with student achievement. In between are the elements of time spent in the curricular area, active learning time of the student, and finally, student comprehension of the curricular content. Other researchers, contributing to the academic learning time concept, have identified the variable of pupil success on a task as a determinant of pupil achievement gain (Fisher, Marliave and Filby, 1979). The more success a student has the better he or
she will master the task assigned, and will spend more time engaged in the learning process.

Another area often investigated under this subtopic is student characteristics which influence on-task behavior. These characteristics normally are identified through comparisons of students performing at or above grade level and students performing below grade level. Scott and Anderson (1978) found that students with higher verbal and quantitative ability spend more of their time on-task and are more consistent in their time-use than lower ability students. It was also found that students with more positive affective characteristics, positive attitudes toward school, interest in particular subject areas, and positive self-perception of their ability to learn, tend to spend more of their time on-task than students with less positive affective traits.

Academic learning time takes into account the issue of disparity in time-use by classroom teachers, and adds the concept of pupil individual differences. Both issues have a profound effect on how time is used in the classroom.

**Time On-Task**

Time on-task or engaged time studies are focused primarily on transitional and interruptive behavior in the classroom which utilize instructional time for noninstructional activities, and how to reduce the incidence of such behavior. The most significant research in this area comes from the
Beginning Teacher Evaluation Study (BTES 1978). Berliner found that teachers who were considered outstanding required a high degree of on-task behavior from their students. Teachers prepared and conducted lessons in which most of the time allocated for the subject was spent in academic interaction.

Time on-task studies have also focused on pupil behavior. Using the observation method, the findings of observation research have varied from significant correlations between time on-task and academic achievement to no correlation between the two variables. Marliave, Fisher, and Dishaw (1978) found that the number of minutes actually spent by students on learning task was related significantly to achievement in mathematics and reading, while Frederick, Walberg and Rasher (1979) found no significant relationship between the variables when prior achievement level is controlled. The discrepancy between research findings caused an examination of the research methodology used. Karweit and Slavin (1979) found that time on-task research results were influenced significantly by the researchers' definition of on-task and off-task behavior, the length of observation visits, and including enough classrooms to provide stable estimates of pupil behavior.

Since the above research was completed, the findings of time on-task investigators show a strong, consistent, and positive relationship between time and learning. An example of the influence of the above research is illustrated by a study which examined sixty (60) secondary English classes using
descriptive time narrative logs (Oneida and Conty 1980). They found that classroom time use and instructional behavior varied among teachers, and that pupil achievement was directly related to on-task behavior of students. Moreover, Sanford and Evertson (1982), studied 102 English and mathematics classes at the junior high school level and found pupil on-task behavior to be positively correlated to academic achievement. To improvement in observation research appears to have a positive affect on time on-task studies.

Allocated Time

Allocated time is the amount actually scheduled for learning activities. Normally, allocated time is the amount of time the building principal schedules for a specific class to meet. It is the only area of pupil-time that can be controlled by a building administrator. Once the time is allocated, the learning activity provided during this time is often dependent on the classroom teacher.

Studies of allocated time have covered several dimensions of schools, which tend to divide instructional time into four areas: 1) years of schooling, 2) days in the school year, 3) hours in the school day 4) and minutes of instruction in a subject area. Frederick and Walberg (1980) summarized several studies which showed added years of school correspond with increased knowledge. Students with more years of schooling had
greater increases in I.Q. and better scores on tests of basic skills.

Days in the calender year studies provide a less clear picture. Perhaps this is due to the small amount of variation found in the number of days in the school year across school districts. However, the most important research in this area involved pupil attendance and its effect on academic achievement. Frederick (1977) found that students who attend school more regularly do better. Often higher rates of absenteeism corresponded with poorer pupil performance. Most studies on absenteeism generally include the variable socioeconomic status which is believed to have a strong influence on pupil attendance. Frederick and Walberg (1980) concluded that student background predicts both achievement and attendance, or that background and attendance are so closely linked that the separate effect of attendance cannot be accurately estimated.

Investigators seeking to find the constraints placed on students' opportunity to learn have discovered a high correlation between length of the school day and student achievement. Stallings and Kaskawitz (1974) and more recently Gilbert and Price (1981), discovered that students benefit substantially from an extended day program. Their findings show that 71% of students who participated in the extended day program had academic grade equivalent gains of five months or more over a four month period. The quality of students'
homework improved, pupil behavior improved and attendance rates increased.

Allocated time is further delineated by researchers who have observed that only a portion of a school day is used for instruction. Lunch, recess, breaks, and other noninstructional activities take up class time. The <strong>Beginning Teacher Evaluation Study</strong> (BTES 1978) concluded that the amount of time teachers allocate to instruction is positively associated with student learning in the content area. Teachers and schools vary widely in their apportioning of instructional time for particular subject areas. In the BTES study some fifth grade reading classes allotted 60 minutes per day for instruction, while others averaged 140 minutes of instruction in the same content area.

The impact of allocated time on pupil academic achievement can be examined from two additional perspectives. First, is the importance of allocated time in subjects that are not taught across the curriculum such as mathematics, science, and foreign languages. Allocated time in these subjects represents the total learning time for the subjects because generally, they are not reinforced in other subjects that fourth graders take; therefore, the impact of allocated time on student academic achievement for math, science and foreign language is significant. In subjects such as reading, English, and history, reinforcement of the required skills can be taught across the curriculum. This allows the extraneous variable of
reinforcement of skills to have a significant impact on the measurement of academic achievement in these areas (Frederick, Walberg 1979). Second, is the relationship between allocated time and student ability. Carroll (1963), Anderson (1980), and Bloom (1974), observed that low ability students need more allocated time to achieve mastery of a subject while students with higher ability need less time and perform at a higher level.

Purpose of the Study

The purpose of the present study is to investigate the relationship between allocated time for Ohio fourth-grade elementary classes and the academic achievement of fourth grade students, as identified by their performances on the Iowa Test of Basic Skills (ITBS). Knowing about the effects of alternate ways to allocate time is important because time-use, in contrast to other inputs, is an area over which administrators have discretionary control. When the differences in allocated time are compared on the basis of pupil achievement, important information will be generated for Ohio educators.

There are several ways to view the findings of this research. One might speculate that in order for students to perform at grade level in reading, at least 300 minutes of instruction must be provided per week. Conversely, one might choose to compare Ohio's time allocation in elementary subjects with the recommended times for those subjects by experts in the
field. Moreover, since allocated time in mathematics is not taught across other subjects, one may ask, "Does Ohio time allocation in mathematics contribute positively or negatively to mathematics achievement?"

An area not previously addressed by time and learning researchers is state policy in respect to time and subject matter. A concern is whether the discretion currently allowed in state minimum standards should be replaced by required time allotments to each subject. If, for example, pupil academic achievement is well below the norm for the Iowa Test of Basic Skills and allocated time in the basic skills areas also is well below the recommended time allotments of the experts in the field, these findings may generate further investigation of the minimum standards. On the other hand, evidence from the study may demonstrate that the minimum standards are producing positive results.

**Research Questions**

What is the relationship between allocated time for Ohio fourth grade elementary classes and academic achievement of elementary students in reading and mathematics?

A. What percentage of Ohio allocated time is spent in academic subjects?

B. How does Ohio time allocation compare with recommended time allotments of experts in the field?
RESEARCH METHODOLOGY

The research methodology section is divided into three parts: sample selection, instrumentation and administration, and statistical procedure.

Sample Selection

A sample of 156 Ohio elementary schools was selected randomly for participation. To avoid sample bias, only one elementary school was selected from each school district. The sample of school districts and elementary schools was limited further to those schools which use the ITBS at the fourth-grade level for determining pupil academic achievement.

Research completed by the Department of Education indicates many of Ohio's elementary schools test at the fourth-grade level. Similarly, several of Ohio elementary schools use the ITBS at this level. Since the sample is randomly selected and is a true reflection of the target population, generalizations can be properly made to the total population of elementary schools in Ohio.

Instrumentation

The instrument (Questionnaire) has three sections. The first is focused on demographic data. Here, a series of questions are asked about the population that attends the school and the community in which the school is located. In the second section, questions are included concerning time
allotments for subjects in the fourth-grade. In the third section, which addresses academic achievement, information is sought concerning pupil academic performance on the Iowa Test of Basic Skills.

The questions concerning demography and time allotments come from an instrument that was developed and field-tested by the Association for Supervision and Curriculum Development (ASCD) in 1983. Questions concerning academic achievement, as measured by scores on the ITBS, come from an instrument developed and used by the Department of Education in 1986.

Administration

One-hundred-fifty-six elementary principals were mailed a copy of the instrument, a letter of introduction to the study which encourages response and a self-addressed stamped envelope for return of the instrument. Principals who did not respond to the initial request were mailed another questionnaire twenty days following the first mailing. Fifteen days after the second mailing, a post card requesting return of the questionnaire was mailed to those who still had not responded.

Statistical Procedure

To address the question of allocated time and pupil academic achievement, two correlation coefficients were used between the sets of scores. First, average allocated time in reading and language arts was correlated with the average ITBS
reading scores. Second, average allocated time in mathematics was correlated with the average Iowa Test of Basic Skills mathematics scores. The Pearson Product Moment Correlation Coefficient was used for these calculations.

Time vs. achievement in reading and mathematics will be assessed as follows:

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<th>Independent Variable</th>
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<tr>
<td>Allocated Time (Reading)</td>
<td>Score in Reading - R value</td>
</tr>
<tr>
<td>Allocated Time (Mathematics)</td>
<td>Score in Mathematics - R</td>
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To address the question of Ohio allocated times for elementary subjects in relation to the recommended times for elementary subjects, requires a test of statistical difference. Ohio time allocation for: reading, social studies, mathematics, science, health, art, physical education, and music are compared to times recommended by the experts in the field. A Hotteling T Square sample test was used. All calculations of the level of statistical difference are determined at the .05 Alpha Level.

Limitations of the Study

There are three limitations to the study. First, the study is concerned with the quantity of student learning time, not the quality of the time. As a result, no attempt is made to make inferences about the quality of instruction being provided in elementary schools being surveyed. Second, the basic source
of information for the study is the reports from building principals. Actual practice may be different. Third, generalizations can only be made to the elementary schools of Ohio, which is the total population for the study.

Significance of the Study

Most of the research relative to time and learning has centered around classroom observation. It also has focused primarily on teacher classroom behavior. Yet, today's concept of the building principal as an instructional leader and the requirements that principals actively become involved in the teaching/learning process, has not been addressed. This research may generate insights useful to the fulfillment of the instructional leadership responsibility. The study is also significant because it involves one of the largest samples ever utilized in time and learning research.

Since a majority of Ohio elementary schools use the Iowa Test of Basic Skills for measuring pupil achievement at the fourth-grade level, it is believed the data generated by the study lead to more accurate generalization to the total pupil population.
CHAPTER 1

FOOTNOTES


Ohio State Minimum Standards, Ohio Department of Education 1983.
CHAPTER II
REVIEW OF THE LITERATURE

The literature review in this chapter is designed to analyze some of the factors which impact upon pupil opportunity to learn in schools. Carroll (1968), Anderson (1980) and others have found student opportunity to learn to be positively related to student academic achievement. More specifically, analysis of time allocated to the subject can be either enhanced or impaired by teacher and student behavior in the classroom. To provide background and aid the study, a broader range of literature review was necessary to help refine the research questions.

Although teacher and student behavior has an impact on achievement, the central focus in this chapter is their affect on the amount of time available to learn for pupils in the classroom.

Teacher Behavior

One of the most comprehensive studies of teacher classroom behavior was done by the California Commission on Teacher Competencies, better known as the beginning teacher evaluation study (BETS 1972-75). The study began by examining beginning teachers. The focus soon changed due to the need for research.
linking teacher behavior to student achievement using experienced classroom teachers.

Phase II of the BETS involved an ethnographic study of twenty classes of second graders and twenty classes of fifth graders. A major finding was that pupil achievement was significantly related to the extent that students are exposed to academic content, allocated time; the percentage of this time actually spent engaged in academic activities; engaged time, and the degree the student was able to respond to the activities successfully, success rate. A second major finding was that pupil engagement rates were positively associated with time spent in substantive interaction, i.e., when the teacher was giving information about academic content, monitoring work, or giving feedback. Engagement rates were low when students spent two thirds or more of their time working alone. The third finding came from examination of what successful teachers emphasized to their students. It was found that teachers who stressed academics produced the most achievement, and teachers who stressed affective objectives produced the least. This finding suggests that a strong academic focus can be compatible with positive student achievement. However, a strong focus on affective objectives is not necessarily compatible with pupil academic achievement.

Another key factor in teacher classroom behavior is how well the teacher manages the work of the classroom in both instructional and noninstructional activities. Some believe it
is closely related to time use (AASA, 1982). Pre-planning for the beginning of a school term, organizing the classroom, making assignments simple are examples of what good teachers do. Researchers investigating this area indicate that the well-organized and well-managed classroom relates positively with successful pupil achievement (Brophy, 1982). It was Kronin (1980) who first demonstrated this conclusively by using a videotaped study of two types of classrooms. The first included the smooth functioning, well-managed version of a classroom, while in contrast, teachers in the comparison classrooms were fighting to keep the lid on. No differences in teachers' methods for dealing with pupil misconduct were found. Kronin identified the differences to be in teacher management skills. Good managers nipped problems in the bud--they monitored the classroom regularly. In Kronin's classrooms teacher's managed by maintaining a continuous academic focus for students' attention and engagement and avoiding downtime.

Another study of teacher behavior was done by Brophy and Evertson (1973) in which they obtained achievement data from students taught three consecutive years by 88 second grade and 77 third grade experienced teachers. They found that the teachers who produced the most achievement gains were businesslike and task-oriented. These teachers operated their classrooms as learning environments, spending most of the time on academic learning activities. The process variables correlating most strongly with achievement were those
suggesting maximal student engagement in activities or dealing with procedures or misconduct. Similar findings were made by Stallings and Kaskowitz (1974), as they observed 108 first grade and 58 third grade classes. The focus of the study was on classroom physical environment. Data were gathered on the time pupils spent in various activities, and frequency counts of adult-child interaction. Again, the findings show positive correlations of achievement with process variables related to student opportunity to learn academic content (time spent in academic activities), frequency of small and large group sessions in basic skills, and frequency of teacher supervision of student seatwork produced better academic performance.

The teachers' ability to structure the class was also found to help maximize pupil achievement (Martin and Oneida, 1980). Students tend to grasp concepts and retain lesson content when teachers structure the material to be presented with overviews, advance organization, or review objectives; outlining the content and signaling transitions between lesson parts; calling attention to main ideas; summarizing subparts of the lesson as it proceeds; and reviewing main ideas at the end. Sanford (1982) studied 102 English and mathematics classes in junior high school. She suggested that how teachers use allocated time coupled with proper teaching methods as previously outlined, has a substantial impact on pupil academic achievement gains. Another important finding of the Sanford research was that even in secondary schools where
uniformity of teaching is thought to be most consistent, a substantial difference exists in teaching methodology.

Teacher behavior, as it relates to proper use of allocated time, was studied by Cornbleth and Karth (1979). Their study involved observation of four fourth grade classrooms in two urban elementary schools. The researchers found that more time was allocated to language and mathematics class and less time allocated to science and social studies classes. However, pupils in language and mathematics classes spent less time engaged in academic activities. While the less frequently offered science and social studies subjects showed a pattern of increasing engaged time. The authors suggest increasing allocated time and that teacher behaviors be improved through the methods described earlier to provide better use of current allocated time.

Seatwork

Throughout this chapter, teacher behavior has been examined to determine its relationship to pupil achievement. It is also appropriate to examine classroom management functions from the perspective of effective teaching. In order to accomplish this task, one must review research on teaching strategies. Teaching strategies have been found to have a profound effect on the amount of time students spend engaged in academic learning. Most teachers use a combination of strategies, including seatwork, whole-class instruction,
mastery learning, individual instruction, subgroupings or peer interaction. The most common teaching strategy used is seatwork. Evertson (1980) found that 50 to 75 percent of pupil instructional time is spent in seatwork. However, through observation research it was discovered that student engagement rates during seatwork average only 70 percent of allocated time. This compares to an 84 percent engagement rate during whole class instruction (AASA, 1982). Students' engagement during seatwork is affected by (a) the degrees to which they are adequately prepared to do the seatwork exercise, and (b) the teachers' monitoring seatwork activity to keep students on task.

Barak, Rosenshine and Stevens (1986) recommend the following procedures which can help increase student engagement during seatwork:

A. The teachers spend more time in demonstration and guided practice.
B. The teacher makes sure students are ready to work alone, by achieving a correct response rate of 80 percent or higher during guided practice.
C. The seatwork activity follows directly after guided practice.
D. The seatwork exercises are directly related to the demonstrations and guided activities.
E. The teacher guides the students through the first few seatwork problems.
There is ample support for these instructional procedures, both in research and in successful programs. Evertson (1980) found that teachers in junior high mathematics whose classes were more engaged during seatwork prepared students for seatwork during demonstration and guided practice. The most effective teachers spent 24 minutes in a 50 minute period in demonstration and guided practice, whereas the least effective teachers spent only ten minutes on these same activities. Seatwork is more likely to be successful when the teacher spends time walking around the classroom to observe the students and answer questions. Fisher (1978) found that when students have contacts with the teacher during seatwork, their engagement rate increases by about ten percent.

**Individualized Instruction**

Individualized instruction is provided in many different formats. Basically, it is defined as a teaching strategy designed to cause interaction between the individual student and the teacher to provide continual feedback in terms of correction or reinforcement of the student's work. Individualized instruction does tend to increase the engagement rate for the student receiving the attention of the teacher. However, the attention given students is often uneven when this strategy is used. According to AASA (1982), teachers normally give most attention to the brightest students and the most disruptive students leaving the majority of the class not
receiving enough. Jane Stallings (1978) says that when teachers give a great deal of time to only certain students, time on-task and academic achievement for the class as a whole suffers. The best example of well run individualized instruction is perhaps provided by special education. Special teachers set up individual learning stations and float between each station providing help for each student. The learning stations also allow students to work at their own rate as long as the teacher has set the stations to meet the needs of the student.

Summary
This subsection has been focused on teacher behavior and the effects of that behavior on pupil time-on-task. This research has been used to clarify effective teacher behavior. Key findings of the research show that classroom structure or how the teacher arranges the class, can impact on pupil time on-task. The teaching strategies used in the classroom can have an affect on pupil engagement rates, and classroom management is a key determinant of pupil time on-task and engagement rate.

The importance of teachers focusing their attention on student acquisition of academic skills is also emphasized in this chapter. It was pointed out that teachers who focused on academics produced greater pupil achievement gains than those who might focus on other developmental skills.
The ability of the teacher to control the classroom environment was positively related to pupil ability to concentrate on the task at hand and, therefore, reduce wasted time.

Student Behaviors Affect on Academic Achievement

The behavior of students can play a significant role in their achievement. On a very basic level, little learning can take place if the student is not actively involved in the learning process. The involvement consists of attention, task persistency, active feedback from the teacher, comprehensiveness of curriculum, and achievement (Bennett, 1981). This concept of pupil involvement in achievement is clearly articulated in a learning process model developed by Bennett (1981). The model shows achievement being accomplished through:

```
<table>
<thead>
<tr>
<th>Quantity of Schooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time allocated to curriculum activities</td>
</tr>
<tr>
<td>Pupil involvement</td>
</tr>
<tr>
<td>Content comprehended</td>
</tr>
<tr>
<td>Achievement</td>
</tr>
</tbody>
</table>
```
Teachers maintain pupil involvement by orchestrating classroom activities. Classroom structures guide pupil behavior and routinization to stabilize pupil actions. Teacher monitoring and how well the teacher is able to provide individualized attention influences pupil involvement. As previously mentioned, pupil involvement is highest when the teacher gives instruction and directs the class. Pupil involvement is lowest during activities such as seatwork or individual study. According to Silverstein (1979), it is during the periods of lowest involvement that pupil misbehavior is most likely to occur. Pupils who are involved in the learning activity are least likely to misbehave in a way that interrupts the learning process for other students.

Misbehavior

Popular attention is often drawn to incidents of severely disruptive behavior and crime in schools such as assault, robbery, theft, vandalism, and drug traffic. Although traumatic when they occur, such acts are generally rare in most schools and most often occur in corridors, restrooms, lunch rooms, and outside the building, rather than in classrooms (Doyle, 1982). This is not the kind of misbehavior being addressed here. The key to understanding misbehavior is to view what students do in the context of classroom structure. From this perspective, misbehavior is any behavior by one or more students that is perceived by the teacher to initiate
action which can lead to a disruption of the planned activity. In most instances, misbehavior is caused by only a few students, while the rest of the class becomes the audience and potential participants in the incident if it spreads (Sanford and Evertson, 1981). Students have become quite skilled at misbehaving during activities. The skill involves the students' ability to hide unproductive time from the teacher. Hargraves (1975) points out that even if conversations stop at the lesson's beginning, they are often resumed where they left off when the teacher turns to write on the chalkboard. He also identified how children cooperate in misbehavior by pointing out the scheme of passing written notes back and forth across the classroom; each pass ideally being made when the teacher's glance is directed elsewhere.

Researchers who have examined the purpose of misbehavior have assigned various functions to it. Doyle (1979) argued that student attempts, especially at the beginning of the year, serve to test the boundaries of the teacher's management system and reveal possible openings for personal agendas. In addition to defining the stability and predictability of the social system of the class, this information can be used to estimate the stringency of academic accountability in the class. Doyle and Cortes (1984) found that frequent student questions and delays in getting work started, functioned as a means of controlling the demander of difficult academic work assignments. Misbehavior contributes to loss of time on-task
and also serves to interrupt pupil engagement. Not only are the individuals involved distracted, but in many cases neighboring students and sometimes the whole class.

According to research done by Brophy and Evertson (1986), a key to handling student misbehavior is keeping the student involved in the lessons and activities of the classroom. Successful teachers accomplish this task by running smooth, well-placed lessons with few interruptions. Successful teachers were also found to be more concerned with order in the classroom than with individual pupil misbehavior.

**Absenteeism**

Student absence rates play a role in decreasing actual learning time. Absenteeism places additional burdens on both student and teacher. The teacher has to repeat instruction for absent pupils while presenting current information to those who have not missed assignments. This can create motivational problems for these students who have not been absent. The student who was absent has to make up work missed and try to keep up with present lessons. Students who have been gone for a number of days may feel left out of the classroom social system and develop an attitude of why try to catch up.

AASA (1982) reports that although absenteeism may appear to be beyond a school's control, principals who initiate special programs to combat it are often highly successful.
Some use competition among classes for highest rate of attendance, with the winning class receiving some reward for its efforts. Other programs have been set up which link pupil attendance with academic credit. These programs are usually found in secondary schools. A combination of excused and unexcused absence that total more than twelve days per grading period can be reason for a grade or credit reduction. Students are rewarded for good attendance or penalized for excessive absence.

**Interruptions**

Classroom interruptions have been discussed earlier in this report from a teacher behavior point of view and a pupil behavior point of view. There are other interruptions which effect the learning time of students that are not controlled by the classroom teacher. AASA (1982) pointed out that policy decisions made at the building, district or state level, may result in unexpected limits on the amount of time allocated for instruction and may mandate specific interruptions of that time.

Seven areas of interruptions were identified by AASA (1982) which are not controlled by the classroom teacher:

1. Scheduling of breaks, announcements and special programs that decrease the instructional time during the school day.
2. Back to basics movement.
3. Resources set aside for actual instruction.
4. Length of the school day and the school year.
5. Inclement weather policies that may decrease the length of the school day or year.
6. Class size.
7. Special programs mandated by the courts or the state or federal government.

A very significant piece of research on interruption was done by Jane Stallings (1980). She found that one of the common interruptions of classrooms was indiscriminate use of the intercom. Many principals do not have scheduled times of day for announcements. Announcements are made when teachers are not expecting them. They may be in the middle of a lecture or worse, students may be taking an examination. From such interruptions, students perceive that class time is not really important. Stallings recommends that principals set aside a few moments every morning for intercom announcements.

Policies on inclement weather days are basically set by state minimum standards in Ohio. These policies generally allow a school district to close school for up to five days if weather conditions make it hazardous for students to get to school. These inclement weather days can reduce the Ohio required days of attendance from 182 to 177 days each year.

All disruption in the classroom distracts student attention from the learning process. These distractions coupled with normal student absence, time-loss between
instructional activities, and the management ability of some classroom teachers accounts for much of the difference in amount of material covered by classes in the same grade level.

**Recommended Time Allocation**

An often heard discussion in elementary schools centers around the amount of time that should be allocated to various subject areas. A study of time allocation done by the Association for Supervision and Curriculum Development (ASCD, 1985), attempted to answer this question. ASCD researchers solicited information concerning optimal time allotments by subject area from university professors teaching in the subject areas, as well as professional curriculum directors employed by school district. Data were gathered for reading/language arts, mathematics, social studies, and science.

Although time per subject area tends to vary a great deal among school districts, the recommendation of the experts in the field were found to be extremely close on the amount of time required per subject. The recommended times were as follows:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Recommended Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading/Language Arts</td>
<td>750 minutes per week</td>
</tr>
<tr>
<td>Mathematics</td>
<td>250 minutes per week</td>
</tr>
<tr>
<td>Social Studies</td>
<td>170 minutes per week</td>
</tr>
<tr>
<td>Science</td>
<td>150 minutes per week</td>
</tr>
</tbody>
</table>
Since the national reports on education, such as A Nation at Risk which was a strong advocate for the back to basics movement, time allocation in other than basic skills subjects have come under close scrutiny from administrators and boards of education (Thompson, 1984). Subject area teachers in art, music, physical education, and elementary foreign language are voicing concern over time being taken away from their subjects and given to basic skills. In states such as Ohio, where a total allotment of 1,100 minutes is the standard, policy makers have significant lee-way to allocate time.

Summary

Teacher behavior, pupil behavior, and the impact they have on pupil academic achievement, have been the focus of this chapter. Also presented was a discussion of the recommended times for fourth grade subjects.

From the literature review, several pertinent points were highlighted: (1) teacher classroom management skills are an important correlate to pupil achievement; (2) student achievement rate tends to be increased when teachers place emphasis on academics; (3) teacher classroom management skills impact pupil time on-task and the amount of time pupils are engaged in learning activities.

The pertinent points discussed concerning pupil behavior were (1) that student misbehavior in class effected time on-task and engagement rate, and (2) that class interruptions and
student absence negatively effect pupil time in subjects and their academic achievement.

Recommended time for elementary subjects was reviewed. Those times in elementary subjects recommended by experts in the field were adopted for this study.
CHAPTER II

FOOTNOTES


Sanford, J., & Evertson, C. (1982). **Time, use and activities in junior high classes.** Austin, Texas: Texas University, Research and Development Center, 5.


Stallings, J. (1980). **Allocated academic learning time revisited, or beyond time on task.** Educational Research, 22.


CHAPTER III
RESEARCH METHODOLOGY

Introduction

The objectives of this study were to examine the relationship between time allocation for various elementary subjects and pupil academic achievement in those subjects. The procedures used to gather data about the population selected are described in this chapter. The chapter contains the following four sections: (a) sample, (b) instrumentation, (c) administration, and (d) treatment of data.

Sample

The target population for this study is all elementary schools that use the Iowa Test of Basic Skills at the fourth grade level. A total of 156 elementary schools meet the criteria. The selected population of schools represents over four thousand fourth grade students.

An examination of the principals' reports (a required reporting document in Ohio) revealed that in terms of school demographics this sample is representative of urban, suburban and rural Ohio schools. Further, the schools represent a diversity in the student demographic categories of racial
composition, sex composition, attendance percent, and percent of students of low socioeconomic status.

The principal of each of the 156 elementary schools was asked to respond to a questionnaire. A return rate of 61% was achieved as 95 principals responded. However, area three of the questionnaire requested information concerning student score on the Iowa Test of Basic Skills. Only 63 of the 156 principals returned these data in a usable fashion. Therefore, findings for the study will be based on computations for both the 63 totally completed questionnaires identified as group 1, and a separate computation for the 32 incomplete instruments identified as group 2. In some cases the data will be calculated for a combined group. All computations will be compared and discussed in Chapter IV.

Instrumentation

One questionnaire was used. It was a two page questionnaire which required about 20 minutes to complete. The questionnaire was composed of three sections. Section one covered essential information about the population of the community in which the school was located, the number of students enrolled in the school, and the average class size of the fourth grade. In each of the three parts of section one principals were asked to select one response on a Likert scale. There was a total of 15 questions in this section. Answers to these questions provided information to help frame each
research question. Thus, demographic data were required for each school that responded to the instrument.

Section two of the questionnaire covered information needed about time allotment for the school, and the fourth grade in particular. Respondents were asked to give the length of the students' instructional day, how many instructional days there were in the school year, and the amount of time allotted for each fourth grade subject. There was a total of 20 questions in this section. Answers to these question provide specific information needed to address the major research question of the study.

Information concerning pupil achievement in reading and mathematics at the fourth grade level was the subject of section three of the instrument. Respondents were asked to provide achievement test date as well as the dates when the achievement tests were administered. These data were important because students who participated in testing programs in the spring of the year had benefit of almost a full year's study at the grade level, while students who were tested in the fall and winter did not. Therefore, interpretations drawn from achievement test results must be sensitive to testing dates.

The questionnaire was developed using appropriate questions from two well established instruments. The questions concerning demography and time allotments came from an instrument developed and field-tested by the Association for Supervision and Curriculum Development (ASCD) in 1983.
Questions concerning academic achievement, as measured by scores on the ITBS, came from an instrument developed and used by the Ohio Department of Education, Division of Guidance and Testing in 1986. When the appropriate questions had been selected and the questionnaire completed, ten elementary principals from the central Ohio area were asked to review the instrument for clarity and to assure that the questions could be easily answered by Ohio elementary principals.

No validity or reliability tests were performed on either instrument used to develop this questionnaire. However, each of the instruments was developed specifically to be used with principals. The ASCD instrument was used with 1,400 principals while the Department of Education instrument was used with over 1,000 principals. Since the instrument prepared for this research did not request opinion or feelings or require judgments to be made no validity or reliability tests were performed.

Administration

The collection of data for the study was facilitated by a process designed to maximize the participant response rate. Each of the 156 elementary principals surveyed received a letter of introduction to the study, a copy of the instrument, and a self-addressed, stamped envelope for return of the instrument.
The results of the first mailing produced a 41% rate of return. A second mailing to principals was prepared in the same manner as the first. As a result of the second mailing, an additional 19% of those surveyed returned the questionnaire. The remaining non-respondents were then mailed a reminder postcard, which asked for completion and return of the questionnaire. This procedure provided an additional response rate of 1%. In total, 95 of 156 elementary principals responded to the survey questionnaire for a response rate of 61%.

**Treatment of Data**

The Iowa Test of Basic Skills (ITBS) was used by all participating school districts to determine student achievement. It is an achievement test which measures student ability to recognize the essentials of good writing, to solve quantitative problems, to analyze discussions of social issues critically, to understand nontechnical scientific reports and to use source of information and common tools of learning. The test requires students to apply their knowledge and skills in analyzing materials that they probably have not seen before. Thus, the tests are designed to measure how well students can use many different competencies.

The ITBS is intended to be administered periodically to all students as part of a school's regular testing program.
The major purpose of the tests can be summarized as follows:

1. To provide teachers, students and others with a periodic, objective description of student achievement. A description that permits comparisons between broad areas of achievement at each testing and also permits an assessment of student growth with respect to important objectives within each area.

2. To provide administrators with a dependable basis judging the relative strengths and weaknesses of the academic portions of the educational offerings: to provide a test that reflects the achievement of all pupils and is not tied to specific instructional methods and materials in any area. ITBS Test Booklet (1983).

In this study, the ITBS serves as an achievement data source in that fourth grade student scores on the Iowa Test are used as the achievement component for the study.

The data were analyzed using statistical procedures described later. There is one research question with two subparts. The research questions addressed are:

What is the relationship between allocated time for Ohio fourth grade classes and academic achievement of elementary students in reading and mathematics?

To determine the relationship between average time and average pupil achievement in mathematics and reading the Pearson Product moment correlation coefficient $r$ was used. The
r value was used to determine the strength and degree of correlation that exists between the two variables. An r value was calculated for both average time versus average reading and time average versus average mathematic scores.

A. What percentage of Ohio allocated time is spent in academic subjects?

To determine the percent of allocated time spent in academic subjects requires a frequency distribution of the means of each of the 12 identified fourth grade subject areas. The mean allocated time for reading/language arts, mathematics, science and social studies reflects the percentage of time spent in academic subjects. All other fourth grade subjects are considered non-academic subjects. Their mean times are reflected also in the frequency distribution. A frequency distribution developed in this manner should present a clear picture of where principals place emphasis on pupil academic skills.

B. How does Ohio time allocation compare with recommended time allotments of experts in the field?

As indicated earlier, the design of the study required an acceptable measure of allocated time to compare with the time allocations used in Ohio school districts represented in this study. The ASCD recommended time allocations were studied. These were acquired by ASCD by asking a range of experts drawn from the education academic community to submit recommended
time allocations in several academic subject fields. Their recommendations appear below:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Minutes per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading/Language Arts</td>
<td>750</td>
</tr>
<tr>
<td>Mathematics</td>
<td>250</td>
</tr>
<tr>
<td>Social Studies</td>
<td>170</td>
</tr>
<tr>
<td>Science</td>
<td>150</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1320</strong></td>
</tr>
</tbody>
</table>

The times recommended above may not be totally agreed to by all members of the education community. Thus, to assure broader acceptance of the times recommended, the minutes used were the same as those used in the 1984 ASCD study. ASCD contacted a variety of experts in the education academic community seeking their allotted time recommendations.

Allotted time recommendations were submitted by the following organizations or people:

- Shelia Fitzgerald: Professor of Education Specializing in Language Arts
- James Gates: Executive Director, National Council of Teachers of Mathematics
- Shirley Frye: Mathematics Specialist Scottsdale, Arizona School District
- Thomas Good: University of Missouri Center for Research
- Thomas Gibney: University of Toledo College of Education
- Lola May: Mathematics Specialist Winnetka, Illinois Schools
- David Berliner: University of Arizona
To compare Ohio time allocation with time recommended by the experts requires a statistic which can provide a measure of statistical difference. The Hotelling $T^2$ statistic is used for reading/language arts, mathematics, science and social studies.

The research methodology described in this chapter produced Ohio schools' time allocations and pupil academic performance data to be compared and analyzed in Chapter IV.
CHAPTER III

FOOTNOTES


CHAPTER IV

PRESENTATION OF FINDINGS AND
ANALYSIS OF DATA

This chapter contains a detailed presentation of the findings for each of the research questions outlined in the statement of the problem. The data are presented in three (3) categories: demographic, time allotment, and achievement data. Each of the research questions is discussed in the order in which it has been presented. In order that the reader may more readily understand the analysis, descriptive tables are presented which summarize the data gathered through the questionnaire. Additionally, tables are illustrating the correlation coefficients and the statistical relationship between certain variables on the questionnaire.

The purpose of this study is to examine the relationship between allocated time and pupil academic achievement at the fourth grade level. Following are the items of the questionnaire with a description of each participants response to the item. Findings for the items will be based on computations for both the 63 totally completed questionnaires identified as group 1, and a separate computation for the 32 incomplete instruments identified as group 2. Where practical, a computation is made for a combined group. All computations will be discussed in Chapter IV.
Demographic Data

Item 1: What is the population category of your school location?

Findings: Respondents indicated, as reported in Table 1, that the majority of elementary schools surveyed were located in rural and small city communities. Group 1 schools had 88.9% in this category, while group 2 schools have 93.8% in the category. When all respondents are considered together, 90.5% were located in rural and small city communities.

Item 2: What is the number of students in your school?

Findings: An examination of data in Table 2 shows 62.9% of the respondents in group 1 are in schools with enrollments between 200-499 students, while 75.6% of group 2 are in such schools. When data from the two groups are combined, 68.1% of all surveyed schools were in this category; 31.9% were in the other categories.

Item 3: What is the average class size of fourth grade pupils?

Findings: In Table 3, the distributions are reported for elementary schools by class size at the fourth grade level. It is interesting to note that 84% of the schools had a class size of 26 pupils or less. The remaining 16% have class sizes of more than 26.
### Table 1

**Distribution of Sample Elementary Schools by Community Population**

<table>
<thead>
<tr>
<th>Community Population</th>
<th>Number of Elementary Schools</th>
<th>Percent of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100,000</td>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td>Suburban</td>
<td>5</td>
<td>7.9</td>
</tr>
<tr>
<td>5,000 - 100,000</td>
<td>16</td>
<td>25.4</td>
</tr>
<tr>
<td>50 - 5,000</td>
<td>16</td>
<td>25.4</td>
</tr>
<tr>
<td>Rural</td>
<td>24</td>
<td>38.1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>63</strong></td>
<td><strong>100.0</strong></td>
</tr>
<tr>
<td><strong>Group 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100,000</td>
<td>1</td>
<td>3.1</td>
</tr>
<tr>
<td>Suburban</td>
<td>1</td>
<td>3.1</td>
</tr>
<tr>
<td>5,000 - 100,000</td>
<td>12</td>
<td>37.5</td>
</tr>
<tr>
<td>50 - 5,000</td>
<td>11</td>
<td>34.4</td>
</tr>
<tr>
<td>Rural</td>
<td>7</td>
<td>21.9</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>32</strong></td>
<td><strong>100.0</strong></td>
</tr>
<tr>
<td><strong>Combined Groups</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100,000</td>
<td>3</td>
<td>3.2</td>
</tr>
<tr>
<td>Suburban</td>
<td>6</td>
<td>6.3</td>
</tr>
<tr>
<td>5,000 - 100,000</td>
<td>28</td>
<td>29.5</td>
</tr>
<tr>
<td>50 - 5,000</td>
<td>27</td>
<td>28.4</td>
</tr>
<tr>
<td>Rural</td>
<td>31</td>
<td>32.6</td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td><strong>95</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
Table 2
Distribution of Sample Elementary Schools by Pupil Population

<table>
<thead>
<tr>
<th>Pupil Population</th>
<th>Number of Elementary Schools</th>
<th>Percent of Sample</th>
</tr>
</thead>
</table>

**Group 1**

| 1 - 199 | 9 | 14.5 |
| 200 - 499 | 34 | 62.9 |
| 500 - 999 | 14 | 22.6 |
| **TOTAL** | **62** | **100.0** |

**Group 2**

| 1 - 199 | 4 | 12.2 |
| 200 - 499 | 25 | 75.6 |
| 500 - 999 | 4 | 12.2 |
| **TOTAL** | **33** | **100.0** |

**Combined Groups**

| 1 - 199 | 13 | 12.8 |
| 200 - 499 | 64 | 68.1 |
| 500 - 999 | 18 | 19.1 |
| **GRAND TOTAL** | **95** | **100.0** |
Table 3

**Distribution of Sample Elementary Schools by Class Size in Fourth Grade Classes**

<table>
<thead>
<tr>
<th>Class Size</th>
<th>Number of Elementary Schools</th>
<th>Percent of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 14</td>
<td>1</td>
<td>1.6</td>
</tr>
<tr>
<td>15 - 20</td>
<td>5</td>
<td>7.9</td>
</tr>
<tr>
<td>21 - 26</td>
<td>47</td>
<td>74.6</td>
</tr>
<tr>
<td>27 - 30</td>
<td>9</td>
<td>14.3</td>
</tr>
<tr>
<td>Above 31</td>
<td>1</td>
<td>1.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>63</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Group 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15 - 20</td>
<td>4</td>
<td>12.5</td>
</tr>
<tr>
<td>21 - 26</td>
<td>19</td>
<td>59.4</td>
</tr>
<tr>
<td>27 - 30</td>
<td>9</td>
<td>28.1</td>
</tr>
<tr>
<td>Above 31</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>32</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Combined Groups</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 14</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>15 - 20</td>
<td>9</td>
<td>9.5</td>
</tr>
<tr>
<td>21 - 26</td>
<td>66</td>
<td>69.5</td>
</tr>
<tr>
<td>27 - 30</td>
<td>18</td>
<td>18.9</td>
</tr>
<tr>
<td>Above 31</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td>95</td>
<td>100.1</td>
</tr>
</tbody>
</table>

**NOTE:** Percentage total may not be 100% due to rounding.
Time Allotment

Item 1: What is the length of the instructional day in your school, exclusive of lunch and recess?

Findings: In Table 4, principals responses are reported relative to the length of the instructional day in their schools.

The wide variations in the length of instructional day tends to confirm results of other studies focused in this area. A total of 46% of students enrolled in elementary schools spend 5.5 hours per day in instructional activities, while 25.4% spend less than 5.5 hours per day in instructional activities. A total of 28.6% of students receive instruction in excess of 5.5 hours per day.

Item 2: How many instructional days are there each year?

Findings: The length of the school year in elementary schools ranged from 175 to 185 days per year. While 53.9% of group 1 schools are open for 180 days, 62.5% of group 2 schools are also 5% open for 180 days. The combined group shows 56.8% of all schools open for 180 days (see Table 5). It should be noted that 180 days are required in the Minimum Standards of Ohio. A total of 85.3% of the sample elementary schools are open between 178-185 days per year. It should be noted that schools are allowed 7 days for closing because of weather or inservice days.
<table>
<thead>
<tr>
<th>Instructional Hours Per Day</th>
<th>Number of Elementary Schools</th>
<th>Percent of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0 Hours or Less</td>
<td>6</td>
<td>9.5</td>
</tr>
<tr>
<td>5.25 Hours</td>
<td>10</td>
<td>15.9</td>
</tr>
<tr>
<td>5.5 Hours</td>
<td>29</td>
<td>46.0</td>
</tr>
<tr>
<td>5.75 Hours</td>
<td>10</td>
<td>15.9</td>
</tr>
<tr>
<td>6.0 Hours</td>
<td>4</td>
<td>6.3</td>
</tr>
<tr>
<td>6.25 Hours</td>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td>6.5 Hours or More</td>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>63</td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

| **Group 2**                 |                              |                   |
| 5.0 Hours or Less           | 4                            | 12.5              |
| 5.25 Hours                  | 9                            | 28.2              |
| 5.5 Hours                   | 13                           | 40.6              |
| 5.75 Hours                  | 3                            | 9.3               |
| 6.0 Hours                   | 2                            | 6.3               |
| 6.25 Hours                  | 1                            | 3.1               |
| 6.5 Hours or More           | 0                            | 0                 |
| **TOTAL**                   | 32                           | **100.0**         |

| **Combined Groups**         |                              |                   |
| 5.0 Hours or Less           | 10                           | 10.5              |
| 5.25 Hours                  | 19                           | 20.0              |
| 5.5 Hours                   | 42                           | 44.2              |
| 5.75 Hours                  | 13                           | 12.7              |
| 6.0 Hours                   | 6                            | 6.3               |
| 6.25 Hours                  | 3                            | 3.2               |
| 6.5 Hours or More           | 2                            | 2.1               |

| **GRAND TOTAL**             | 95                           | **100.0**         |
### Table 5

**Distribution of Sample Elementary Schools by Length of School**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Instructional Days</th>
<th>Number of Elementary Schools</th>
<th>Percent of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Group 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>175</td>
<td>1</td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>178</td>
<td>18</td>
<td></td>
<td>28.6</td>
</tr>
<tr>
<td>179</td>
<td>2</td>
<td></td>
<td>3.2</td>
</tr>
<tr>
<td>180</td>
<td>34</td>
<td></td>
<td>53.9</td>
</tr>
<tr>
<td>181</td>
<td>1</td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>182</td>
<td>5</td>
<td></td>
<td>7.9</td>
</tr>
<tr>
<td>184</td>
<td>1</td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>185</td>
<td>1</td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>63</td>
<td></td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Group 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>175</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>178</td>
<td>6</td>
<td></td>
<td>18.7</td>
</tr>
<tr>
<td>179</td>
<td>1</td>
<td></td>
<td>3.1</td>
</tr>
<tr>
<td>180</td>
<td>20</td>
<td></td>
<td>62.5</td>
</tr>
<tr>
<td>181</td>
<td>4</td>
<td></td>
<td>12.5</td>
</tr>
<tr>
<td>182</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>184</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>185</td>
<td>1</td>
<td></td>
<td>3.1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>32</td>
<td></td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Combined Groups</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>175</td>
<td>1</td>
<td></td>
<td>1.1</td>
</tr>
<tr>
<td>178</td>
<td>24</td>
<td></td>
<td>25.3</td>
</tr>
<tr>
<td>179</td>
<td>3</td>
<td></td>
<td>3.2</td>
</tr>
<tr>
<td>180</td>
<td>54</td>
<td></td>
<td>56.8</td>
</tr>
<tr>
<td>181</td>
<td>5</td>
<td></td>
<td>5.3</td>
</tr>
<tr>
<td>182</td>
<td>5</td>
<td></td>
<td>5.3</td>
</tr>
<tr>
<td>184</td>
<td>1</td>
<td></td>
<td>1.1</td>
</tr>
<tr>
<td>185</td>
<td>2</td>
<td></td>
<td>2.1</td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td>95</td>
<td></td>
<td>100.2</td>
</tr>
</tbody>
</table>
In Table 6, the mean time reported for reading/language arts is 507.6 minutes per week for group 1, and 517.8 minutes per week for the combined group, with a standard deviation of 152.4 for group 1 and 151.6 for the combined group. Allocated time in reading/language arts ranged from a low of 200 minutes per week to a high of 775 minutes per week. Variations in allocated time for mathematics were similar to those for reading/language arts. Group 1 participants had a mean time of 235.2 for mathematics, while the combined group participants had a mean of 238.7 for mathematics. The standard deviation for group 1 was 47.9 and the combined group had a standard deviation of 45.9. Allocated time went from a low of 200 minutes per week to a high of 350 minutes per week.

The mean time for science for group 1 participants was 142.6 minutes per week with a standard deviation of 48.1. The combined group had a mean of 139.7 minutes per week and a standard deviation of 46.9. Allocated minutes in science ranged from a low of 120 minutes per week to a high of 270 minutes per week. In social studies, the mean allocated time for group 1 was 186.2 minutes per week, with a standard deviation of 50.1. The combined group had a mean time of 181.4, with a standard deviation of 46.9. Allocated minutes per week ranged from a low of 105 minutes to a high of 300 minutes.

Nonacademic subject areas traditionally are allocated much less time by most schools. Even so, a wide variation exists
among the elementary schools in these subject areas. Physical education classes had a mean time of 71.3 minutes and a standard deviation of 16.2 for group 1. The combined group mean was 72.5, with a standard deviation of 24.7. Allocated

Table 6
Mean, Standard Deviation, and Range of Ohio Allocated Time by Subject Area in Sample Schools

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minutes Per Week Low</th>
<th>Minutes Per Week High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1 (N = 63)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading/Language Arts</td>
<td>507.6</td>
<td>152.4</td>
<td>200</td>
<td>775</td>
</tr>
<tr>
<td>Mathematics</td>
<td>235.2</td>
<td>47.9</td>
<td>200</td>
<td>350</td>
</tr>
<tr>
<td>Science</td>
<td>142.6</td>
<td>48.1</td>
<td>120</td>
<td>270</td>
</tr>
<tr>
<td>Social Studies</td>
<td>186.2</td>
<td>50.1</td>
<td>105</td>
<td>300</td>
</tr>
<tr>
<td>Physical Education</td>
<td>71.3</td>
<td>16.2</td>
<td>40</td>
<td>120</td>
</tr>
<tr>
<td>Health</td>
<td>75.2</td>
<td>36.8</td>
<td>30</td>
<td>225</td>
</tr>
<tr>
<td>Art</td>
<td>67.3</td>
<td>21.9</td>
<td>30</td>
<td>125</td>
</tr>
<tr>
<td>Music</td>
<td>67.3</td>
<td>16.8</td>
<td>40</td>
<td>120</td>
</tr>
<tr>
<td>Recess</td>
<td>115.6</td>
<td>63.2</td>
<td>30</td>
<td>225</td>
</tr>
<tr>
<td>Lunch</td>
<td>117.1</td>
<td>69.6</td>
<td>150</td>
<td>225</td>
</tr>
<tr>
<td>Other</td>
<td>95.1</td>
<td>88.0</td>
<td>30</td>
<td>245</td>
</tr>
<tr>
<td><strong>Combined Group (N = 95)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading/Language Arts</td>
<td>517.8</td>
<td>151.6</td>
<td>200</td>
<td>775</td>
</tr>
<tr>
<td>Mathematics</td>
<td>238.7</td>
<td>45.9</td>
<td>200</td>
<td>350</td>
</tr>
<tr>
<td>Science</td>
<td>139.7</td>
<td>46.9</td>
<td>120</td>
<td>270</td>
</tr>
<tr>
<td>Social Studies</td>
<td>181.4</td>
<td>46.9</td>
<td>105</td>
<td>300</td>
</tr>
<tr>
<td>Physical Education</td>
<td>72.5</td>
<td>24.7</td>
<td>45</td>
<td>120</td>
</tr>
<tr>
<td>Health</td>
<td>75.3</td>
<td>33.5</td>
<td>30</td>
<td>200</td>
</tr>
<tr>
<td>Art</td>
<td>69.4</td>
<td>28.4</td>
<td>30</td>
<td>250</td>
</tr>
<tr>
<td>Music</td>
<td>69.8</td>
<td>25.0</td>
<td>35</td>
<td>90</td>
</tr>
<tr>
<td>Recess</td>
<td>120.8</td>
<td>62.6</td>
<td>30</td>
<td>225</td>
</tr>
<tr>
<td>Lunch</td>
<td>133.7</td>
<td>73.9</td>
<td>60</td>
<td>225</td>
</tr>
<tr>
<td>Other</td>
<td>87.0</td>
<td>76.8</td>
<td>30</td>
<td>245</td>
</tr>
</tbody>
</table>
time for physical education ranged from a low of 45 minutes to a high of 120 minutes. Health classes for group 1 had a mean time of 75.2 minutes per week and a standard deviation of 36.8. Combined group had a mean time of 75.3, with a standard deviation of 33.5 minutes per week. Time of instruction in health classes ranged from a low of 30 minutes per week to a high of 250 minutes per week. Art and music had similar mean times for both groups. Group 1 mean minutes per week for art was 67.3; for music, the mean was 67.3. The standard deviation for art was 21.9, and for music it was 16.8. The combined group showed mean minutes per week for art at 69.4, while the mean for music was 69.8. The standard deviation for art in the combined group was 28.4, while music's standard deviation was 25.0. Minutes per week in art ranged from a low of 30 minutes to a high of 125 minutes per week. Music minutes ranged from a low of 40 minutes to a high of 225 minutes per week.

**Achievement**

Item 1: What is the average Normal Curve Equivalent (NCE) score on the Iowa Test of Basic Skills (ITBS) for each fourth grade class in reading and mathematics?

Findings: Data were provided for five sections of reading and five sections of mathematics in each of the 63 elementary schools that responded to this part of the study. Reading scores ranged from a mean of 56.06 NCEs to 66.00 NCEs, with a standard deviation from 0.00 to 7.06 NCEs for all five sections.
of reading. The range of NCE scores in reading for fourth grade pupils was from 33.00 NCEs to 81.00 NCEs. The mean NCE score for all five sections of reading in the 63 responding elementary schools was 57.46 NCEs.

Mathematics scores ranged from a mean of 55.5 NCEs to 68.00 NCEs, with a standard deviation from 0.00 to 8.32 NCEs for all five sections in mathematics. The range of NCE scores in mathematics for fourth grade pupils was from 36.00 NCEs to 96.00 NCEs. The mean NCE score for all five sections of mathematics in the 63 responding elementary schools was 56.24 NCEs.

Table 7
Pupil Academic Achievement Data by Normal Curve Equivalent (NCE) Score on the Iowa Test of Basic Skills (N = 63)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading 1</td>
<td>56.06</td>
<td>8.83</td>
<td>33.00</td>
<td>75.00</td>
</tr>
<tr>
<td>Reading 2</td>
<td>57.88</td>
<td>7.06</td>
<td>47.00</td>
<td>78.00</td>
</tr>
<tr>
<td>Reading 3</td>
<td>58.93</td>
<td>7.32</td>
<td>46.00</td>
<td>81.00</td>
</tr>
<tr>
<td>Reading 4</td>
<td>58.57</td>
<td>7.49</td>
<td>50.00</td>
<td>80.00</td>
</tr>
<tr>
<td>Reading 5</td>
<td>66.00</td>
<td>0.00</td>
<td>66.00</td>
<td>66.00</td>
</tr>
<tr>
<td>Mathematics 1</td>
<td>66.00</td>
<td>0.00</td>
<td>66.00</td>
<td>66.00</td>
</tr>
<tr>
<td>Mathematics 2</td>
<td>55.5</td>
<td>9.89</td>
<td>34.00</td>
<td>96.00</td>
</tr>
<tr>
<td>Mathematics 3</td>
<td>56.8</td>
<td>8.32</td>
<td>36.00</td>
<td>76.00</td>
</tr>
<tr>
<td>Mathematics 4</td>
<td>58.2</td>
<td>12.50</td>
<td>41.00</td>
<td>96.00</td>
</tr>
<tr>
<td>Mathematics 5</td>
<td>68.0</td>
<td>0.00</td>
<td>68.00</td>
<td>68.00</td>
</tr>
</tbody>
</table>

Mean - Reading/Language Arts Score = 57.46
Mean - Mathematics Score = 56.24
Research Questions

One central research question with two subparts was used to guide this study. The following is an analysis and interpretation of the data used to respond to each question.

Research Question:

What is the relationship between allocated time for Ohio fourth grade elementary classes and academic achievement of elementary students in reading and mathematics?

To address this question, the mean allocated time from reading/language arts and mathematics was correlated with the mean Normal Curve Equivalent (NCE) score. A Pearson correlation coefficient was used to determine if a relationship exists between the two variables. Table 8 contains the mean, standard deviation, Pearson R-value and NCE score for both variables. The R-value of .16 for reading/language arts and the R-value of .10 for mathematics indicates that no statistically significant relationship exists at the .05 score between Ohio allocated time and pupil academic achievement in reading/language arts and mathematics. In the sample population, this finding differs from the previous research done on the subject, because time and learning are generally found to be significantly correlated.
Table 8
Mean Scores, Standard Deviation and Pearson Correlation of Allocated Time and NCE of Pupil Achievement (N = 63)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson R Value</th>
<th>Normal Curve Equivalent Score Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading/Language Arts</td>
<td>517.8</td>
<td>151</td>
<td>.16</td>
<td>57.46</td>
</tr>
<tr>
<td>Mathematics</td>
<td>238.7</td>
<td>45</td>
<td>.10</td>
<td>56.24</td>
</tr>
</tbody>
</table>

Research Question A:
What percentage of Ohio allocated time is spent in academic subjects?

The mean allocated time in elementary schools was 1706.19 minutes per week. To determine the percentage of time spent in academic subjects required establishing each school's total allocated time and comparing each subject's allocated time to the school's total so that a percentage could be determined.

Academic subjects were reading/language arts, mathematics, science, and social studies. On average 30% of the total weekly allotted time in the sample schools is devoted to reading/language arts instruction. The weekly allocated time for mathematics instruction represents 13.9% and social studies 10.6% of the total allotment of time. Together, academic subjects consume 62.7% of the weekly allocated time in these
elementary schools. Translated into minutes, this means that of the 1706.19 minutes available per week, 1077.6 minutes per week are spent in academic subjects.

Nonacademic subjects include Physical Education, Health, Art, Music, Recess, Lunch and other. Nonacademic subjects consume 36.5% of the total weekly allotted time. Another finding in this area was that sample schools set aside 7% of their allocated time for recess. More time is spent in recess than all other nonacademic subjects except lunch. The percentage breakdown by subject area is shown in Table 9.

Research Question 1.B:

How does actual Ohio time allocation compare with recommended time allotment of experts in the field?

A one sample Hotelling T² test was used to compare Ohio allocated time with time recommended by experts in the subject areas. Mean allocated time values for reading/language arts, mathematics, science and social studies from sample schools were used. The Hotelling T² statistic indicated an overall difference between Ohio allocated time and recommended time by experts. This relationship was further examined by one-sample test.

It should be noted that Ohio allocated time for each subject area variable was found to be significantly different from the recommended times of the experts. Each subject area variable is less than the recommended times of the experts,
Table 9

Percent of Ohio Allocated Time Spent in Academic and Nonacademic Subjects (N = 95)

<table>
<thead>
<tr>
<th>Academic Subject</th>
<th>Percent of Total Time</th>
<th>Mean Allocated Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>English/Language Arts</td>
<td>30.0</td>
<td>517.8</td>
</tr>
<tr>
<td>Mathematics</td>
<td>13.9</td>
<td>238.7</td>
</tr>
<tr>
<td>Science</td>
<td>8.2</td>
<td>139.7</td>
</tr>
<tr>
<td>Social Studies</td>
<td>10.6</td>
<td>181.4</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>62.7</strong></td>
<td><strong>1077.6 Minutes</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nonacademic Subjects</th>
<th>Percent of Total Time</th>
<th>Mean Allocated Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Education</td>
<td>4.2</td>
<td>72.5</td>
</tr>
<tr>
<td>Health</td>
<td>4.4</td>
<td>75.3</td>
</tr>
<tr>
<td>Art</td>
<td>4</td>
<td>69.4</td>
</tr>
<tr>
<td>Music</td>
<td>4.1</td>
<td>69.8</td>
</tr>
<tr>
<td>Recess</td>
<td>7</td>
<td>120.8</td>
</tr>
<tr>
<td>Lunch</td>
<td>7.8</td>
<td>133.7</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>87.1</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>36.5</strong></td>
<td><strong>628.6 Minutes</strong></td>
</tr>
</tbody>
</table>

Per Week
except social studies which was found to be more than recommended. Reading/language arts had a mean allocated time of 517.8 minutes per week. The experts recommended 750 minutes per week for this subject area. The one sample T of -14.53 at (P > .01) can be interpreted to mean that Ohio allocated time in reading and language arts is significantly less than the time recommended by the experts.

The findings for mathematics are similar. Ohio mean allocated time for mathematics is 238.7 minutes per week and the recommended time for mathematics is 250 minutes per week. The one sample T between the variables is -2.34 (P > .01) level of significance, which indicates that Ohio mean allocated time in mathematics is very closely related to the recommended times of the experts. There is 11.3 minutes less time allocated in Ohio per week for mathematics than recommended by the ASCD experts.

In the science subject area, a one-sample T score of -6.08 indicates a negative correlation between Ohio allocated time in fourth grade science. Ohio mean time in science is 139.7 minutes per week and the experts recommend 150 minutes per week. Social studies is the only Ohio fourth grade allocated time that was found to be above recommended time. The one-sample T score of 6.43 shows Ohio with a mean allocated time for social studies of 181.4 minutes per week to be significantly higher than the recommended time of 170 minutes advocated by the experts. In Table 10 mean, standard
deviations, one-sample T score, and recommended time for each subject area compared are shown.

Table 10

Relationship Between Ohio Allocated Time and Recommended Times of Experts

<table>
<thead>
<tr>
<th>Subject</th>
<th>Allocated Time</th>
<th>Recommended Time</th>
<th>One Sample T</th>
<th>D.F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading/Language Arts</td>
<td>517.8</td>
<td>750</td>
<td>-14.53</td>
<td>89</td>
</tr>
<tr>
<td>Mathematics</td>
<td>238.7</td>
<td>250</td>
<td>-2.34</td>
<td>90</td>
</tr>
<tr>
<td>Science</td>
<td>134.7</td>
<td>150</td>
<td>-6.08</td>
<td>88</td>
</tr>
<tr>
<td>Social Studies</td>
<td>181.4</td>
<td>170</td>
<td>6.43</td>
<td>89</td>
</tr>
</tbody>
</table>

(a) Negative value of T statistic implies Ohio allocated time was less than comparison time.

p > .05

Summary

In Chapter IV, findings were generalized from an analysis of the data. Each research question was addressed and analyzed. Demographic data were used to show the makeup of the schools involved in the study and the similarities and
differences of the sample schools on a predetermined time allocation criteria.

In Chapter V, these findings are summarized and conclusions drawn in respect to each research question.
CHAPTER IV

FOOTNOTES


CHAPTER V
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The present study is summarized in this chapter. The conclusions reached through the analysis of the data in regards to the research questions, the demographic variables and recommendations for further research are presented. The chapter is organized to include (a) a summary, (b) conclusions and discussion, and (c) implications and recommendations for future research.

Summary

This study was designed to investigate the relationship between allocated time for various elementary subjects and pupil academic achievement in those subjects.

A selected review of the literature with regard to the variables was conducted. Generally, the literature review indicated the following:

1. Carroll (1963), indicates that the degree of learning equals the time spent learning divided by the amount of time needed to learn.

2. Sanford and Evertson (1982), find time and learning to be positively correlated.
3. The Beginning Teacher Evaluation Study (BETS 1978) researchers concluded that the amount of time allocated to instruction is positively associated with student learning in the content areas.

4. Marliave, Fisher, and Dishaw (1978), found that the number of minutes spent by students on learning tasks was related significantly to achievement in mathematics and reading.

5. Scott and Anderson (1978) reported that students who perform above grade level spend a higher degree of their classtime involved in instructional activity.

6. Frederick, Walberg, and Rasher (1979), found no significant relationship between time and achievement when prior achievement level is controlled.

As important as each of these arenas of research has been, there remains the question, unexplored to date, of the relationship between allocated time and pupil achievement. The research summarized above addresses several questions of the relationship between time and learning, but omits reference to the extent to which allocated time, arrived at either as a matter of local district policy or building level decision, relates to pupil achievement. Thus, the outcome of this research add an increment to general understanding of the relationship between time and learning and by implication, the significance of policy decisions about allocated time. And to this research, added value is achieved through the introduction
of expert judgment as an added lens through which to view allocated time as reported by principals participating in the study.

The population in this study was chosen from the elementary schools in Ohio. The unit of analysis was elementary schools that use the Iowa Test of Basic Skills (ITBS) at the fourth grade level to measure pupil achievement. A total of 156 eligible school districts met the criteria. All 156 eligible school districts were invited to participate. One elementary school was randomly selected from each school district. The principal from each elementary school was asked to complete a two-page questionnaire and thus, was each district's respondent. Principals' response rate was 61%.

Analysis of the Ohio demographic data revealed a similarity between elementary schools in the sample population and schools involved in other time and learning research projects. The pupil population of Ohio schools was very similar to pupil populations in the beginning teacher evaluation study (1978), and the pupil population of schools involved in the Association of Supervision and Curriculum Development study (1985). The enrollment size of the sample schools is very comparable to enrollments for the elementary schools used in these studies. Furthermore, class size of the sample population was consistent with class size recommended by major educational organizations. Eighty percent of Ohio's fourth grade classes have a pupil count of 26 to 1 or less.
Although length of instructional day showed considerable variability within sample schools, 69.5 percent of schools reported that instruction is provided for at least five and a half hours per day. This finding is considerably different from national studies which show that 56.3 percent of students receive instruction for less than five and one-half hours per day. As pointed out by Stallings and Kaskowitz (1974), this difference in time adds up over the course of a school year and places students who may not be getting enough instructional time at a disadvantage in academic achievement.

**Conclusions and Discussion**

The central generalizations derived from this study are discussed below:

1. Elementary schools in this population show wide variation in the distribution of allocated time per fourth grade subject areas.

   The discretion allowed under Ohio State Minimum Standards is reflected by the variation found in allocated time per subject area. Ohio elementary schools are controlled by local boards of education, which have authority to determine the curriculum for schools under their jurisdiction. The variation in allocated time reflects the exercise of discretion on the part of school boards and local administrators.

   This variation in allocated time produces an unequal opportunity to learn for Ohio elementary students in the sample
population. It is particularly important in academic or basic skills subjects. Some pupils in this study receive twice the amount of allocated time in reading/language arts, mathematics, science, and social studies, as do others.

2. Total allocated time for elementary schools exceeds Ohio Minimum Standard requirements.

Elementary schools in Ohio are required to complete 1100 minutes of instruction per week. Schools in the sample have total allocated times well above Ohio's requirement. Allocated time for fourth grade classes averaged 1,706 minutes per week, or 606 minutes more than required.

The total allocated time is significant when compared to the variation of allocated time in subjects. It suggests that schools are very conscious of total allocated instructional time, and make an attempt to safe-guard the instructional school day.

This point becomes clearer when viewed in terms of hours in the school day. Of the elementary schools sampled, 69.5% either meet or exceed the five and one-half hours required in Ohio State Minimum Standards. Ohio schools also exceed elementary schools nationally in this respect. The ASCD study (1985) revealed that most elementary schools do not meet the five and one-half hour instructional day. A student graduating under a five and one-half hour instructional day system spends 114 more days in school, from first grade to twelfth grade, than a student with a five hour instructional day.
3. Fourth grade elementary school pupil achievement in the sample schools was above the national average in reading/language arts and mathematics.

An analysis of the data from the Iowa Test of Basic Skills reveals Ohio elementary pupil performance in reading/language arts and mathematics is above the national average pupil performance for fourth grade students. Nationally, fourth-graders have an average Normal Curve Equivalent (NCE) score of 50.0 for both reading/language arts and mathematic subjects. Ohio pupils from the sample schools have an average NCE of 57.5 in reading/language arts and an average of 56.24 in mathematics. Both scores represent a significant increase in NCEs above the national average NCE score.

It is not a surprise to find Ohio pupil performance at the fourth grade level to be above the national average. At high school grade levels, Ohio pupils consistently score above the national average. Ohio scores on the American College Test (ACT) are 19.3 while the U.S. average is 18.7; and on the Scholastic Appitude Test (SAT), Ohio scores 934 while the U.S. average is 891. These scores provide validity for the statement.

Caution should be used in making generalizations about the achievement data provided by respondents to the questionnaire. Due to the small number of returns on the achievement component, despite the attempts to improve the response rate, there is a possibility that only schools with good performance
completed this section of the questionnaire. It should also be noted that there was no way to compel responses or to administer the ITBS directly. Therefore, the data could be skewed towards higher academic achievement scores since not all schools responded.*

4. Allocated time was not related to pupil academic achievement.

The major research question for this study was: What is the relationship between allocated time and academic achievement of fourth grade students? To answer the research question, a Pearson correlation coefficient was used to ascertain the degree of relationship. Allocated time for reading/language arts and pupil academic achievement had an R. value of $R = .162$ and mathematics and pupil achievement had an R. value of $.102$. In order for two variables to be considered practically related, the R value should be as close to a positive or negative 1 as possible. The R values above indicate no significant relationship between allocated time and pupil academic achievement.

Allocated time was found to be below recommended levels while pupil academic achievement was above the national mean score for fourth grade pupils. In order for a relationship to be significant, either academic achievement scores would have to be lower or allocated time for reading/language arts and mathematics would have to be higher.
This finding differs from Carroll's model and also from previous research on allocated time. The finding appears to indicate that in Ohio schools the time used is of high quality, with pupils achieving mastery of the subject matter covered.

This concept can be supported by previous research. There is a substantial body of research supporting the theory that the amount of time students spend actually engaged in learning activities is as important as the amount of time allocated to the subject (Anderson 1980, Graden 1982, Karweit and Slavin 1976). Students tend to have higher levels of performance when they spend the majority of their allocated time engaged in instructional activity.

Another concept that might be important to understand the Ohio findings concerns "task difficulty." Berliner (1976) theorized that better pupil achievement occurs when the time allotted is spent on instructional tasks that are at an appropriate level of difficulty.

The concepts of task difficulty and the amount of allocated time spent with pupils actively engaged in instruction may help to account for pupil academic achievement levels in Ohio elementary schools being above the national norm. Neither of these concepts was a part of this study, but both concepts are considered very important by time and learning researchers studying classroom activities which assist pupil academic achievement.
5. Ohio elementary schools devote a significant percentage of allocated time to academic subjects.

In this study, academic subjects were reading/language arts, mathematics, science and social studies. Ohio schools showed a mean allocated time for academic subjects of 1077.6 minutes per week, which is 62.7 percent of the total allocated time for all elementary subjects. The percentage of time for academic subjects for Ohio schools may be somewhat less than the percentages for elementary schools nationally. According to the Association for Supervision and Curriculum Development (ASCD) study (1985), approximately 75% of allocated time is devoted to academic subjects nationally. Although Ohio schools allocate 13% less time to academic subjects, they allocate a total of 1706.19 minutes per week to elementary classes, and according to the same ASCD study, this time allocation is almost a full class period per day above the mean time allocation nationally, which minimizes the difference between Ohio time spent in academic subjects and time spent in academic subjects nationally.

Nonacademic subjects were physical education, health, art, and music. Lunch, recess, and other were categories included on the question under the nonacademic section. These subjects accounted for 36.5 percent of the total weekly time allotment. Lunch and recess account for the majority of allocated time in nonacademic subjects. This finding is consistent with the ASCD study conclusions. In general, nonacademic subjects account
for slightly more than one-fourth of the total time allocated for elementary schools.

6. Ohio allocated time in sample schools was less than time recommended by experts in the field.

Research question 1-B was: How does Ohio time allocation compare with recommended time allotments of experts in the field?

According to results of the Hoteling $T^2$ test, a negative relationship exists for all academic subject area variables between Ohio allocated time and time recommended by experts in the subject area field. The only exception was social studies, which had a positive relationship. Ohio social studies classes have a mean allocated time of 181.4 minutes per week and the recommended time allotment is 170 minutes per week. In Ohio, more time is allocated to social studies than to science; almost 42 minutes more per week. This finding concurs with other studies, such as the ASCD (1985) research, which found 30 minutes more time being allocated to social studies than science.

Mathematics allocated time was negatively related to the recommended time but was very close. Ohio mean allocated time for mathematics was 238.7 minutes per week while the experts recommended 250 minutes per week. This may account for the above-average performance of Ohio students in mathematics on the Iowa Test of Basic Skills for fourth-graders.
Reading/language arts, as in national studies, received the most allocated time in Ohio. The time allocated to reading/language arts is almost twice the time allocated to any other subject. However, it is well below the time recommended by experts in the field. The experts recommend 750 minutes per week while Ohio fourth-graders receive 517.8 minutes per week, nearly four hours less per week.

Allocated time in reading/language arts was found not to be related to Ohio pupil academic performance in reading/language arts. However, since pupil performance is above the national average, it may indicate that reading/language arts instruction is well integrated into the curriculum at the elementary level and reinforced in other subjects taught at this level.

Implications and Recommendations

Most Ohio elementary schools attempt to provide a reasonable distribution of allocated times for the academic subjects of reading/language arts, mathematics, science, and social studies. In most Ohio elementary schools, however, the average number of minutes provided for basic skills subjects falls below area specialist recommendations. This may mean that insufficient time is set aside for development of basic skills.

In Ohio, schools tend to follow the mandates of the State Minimum Standards. Perhaps consideration should be given to
examining these Standards, to address in general terms the required time allocations for basic skills subjects. Specifically, elementary science, mathematics and reading, could be increased by Standards which call for a minimum number of minutes for each of the subjects. This will be difficult to accomplish when the legislature and others continue to require separate courses for academic subjects such as drug abuse, AIDS and other content about societal problems, which tend to reduce the allocated time available to academic and other traditional subjects.

Allocated time was found not to be related to Ohio elementary schools pupil achievement. One reason for the finding appears to be the relatively high pupil achievement versus the relatively low allocated time for reading and mathematics. Allocated time for reading/language arts in the sample population was 517.8 minutes per week, 232.2 below the recommended time of 750 per week; while academic achievement in reading/language arts was above the national average 50.00 N.C.E. with a sample average score of 57.46 N.C.E. The same trend existed in mathematics with allocated time for the sample of 238.7 minutes per week, 11.3 minutes less than the recommended time of 250 minutes per week. Yet, the sample population mathematics achievement scores were an average 56.24 N.C.E. well above the national average 50.00 N.C.E.s. The only conclusion to be drawn from this data is that something other than allocated time is responsible for the achievement levels
found in the sample population. Further examination of this phenomenon from a classroom teacher perspective is needed. Perhaps researchers using all the variables that have been found to have an impact on pupil academic achievement may identify what occurs in Ohio classrooms that produces above average achievement.

In addition to those variables mentioned above, socio-economic level, race and sex need to be added. It will be helpful to examine urban, suburban, and rural schools utilizing these variables. In 1991, the Ohio state-mandated testing program will provide data useful in answering the above questions.

Another important implication concerns the relationship between Ohio elementary schools and the Minimum Standards of the State. In each category that could be compared, a majority of the schools were found to meet or exceed the requirements. On recommended minutes of instruction, schools were well above the requirements with 1706 average minutes per week as opposed to 1100 minutes per week required by the standards. Likewise, on standards of class size, 80% of fourth grade classes were under the 26 to 1 required ratio. On hours in the instructional day and number of instructional days per year participants exceeded the requirements: 68% exceeded hours in the instructional day and 85.3% were above the required days per year. This is significant in that it indicates the
overall time allocation standards are achievable by all schools.

It can also be assumed that the minimum standards may not need any substantial change, because students are above the norm on the critical variables of achievement. However, this study does indicate the need to be more specific on allocated time standards for specific subjects. Perhaps the standards could address directly the amount of allocated time that should be devoted to academic subjects which seem to reflect parental and community concerns.

The final conclusion to be drawn from the study is tied to several identified factors. The average allocated time for Ohio elementary schools is 1706.19 minutes per week with 62.7 percent of this time spent in academic subjects. Academic achievement is above the national norm. When the three factors are combined with the national trend (to address today's social ills in public school classes), one has to assume that eventually such socially-oriented subject additions will cause a lowering of allocated time for critical basic skills subjects. To accommodate growth in the number and range of subjects, either the school day will have to be extended or schools will have to provide enrichment courses at the end of the school day, or the number of school days will have to be increased. All of these things cannot be done within the regular school calendar.
CHAPTER V

FOOTNOTES


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APPENDICES
APPENDIX A

STATE MINIMUM STANDARDS
State Minimum Standards

An area of interest in the study is how sample schools compare with existing state minimum standards in areas surveyed for the study. There are four minimum standards that can be compared with sample schools data. The comparisons are as follows:

1. Each building shall be open for instruction with pupils in attendance for 182 days. Two days may be deducted for parent/teacher conferences and 2 days can be deducted for teacher inservice.

With the allowed for deductions, each school is expected to provide 176 days of instruction per year. 85.3 percent of sample schools exceed this requirement with total school days of 178 - 180 per year. This indicates that sample schools are approving school calendars with more days of school than required.

2. The school day for pupils in grades one through six shall consist of scheduling classes, supervised activities, or approved educational options for at least five hours exclusive of the lunch period.

On the minimum standard length of school day sample schools were found to generally meet or exceed the minimum standard. Sixty-eight percent of the sample schools were found in this category. However, a considerable number of schools were found to be below the minimum standards on this item. Thirty percent of the sample were not meeting this standard. This indicates that state school evaluators should take a close look at this item during school visitations.
3. A minimum of eleven hundred minutes per week shall be allocated at each elementary grade level for planned instruction in English/language arts, health, mathematics, science and social studies. Foreign language instruction may be included in the eleven hundred minutes.

Sample schools had a mean allocated time of 1706 minutes per week. Their allocated time for instruction far exceeded the total minimum required time for elementary schools.

4. A minimum of two hundred minutes per week shall be allocated at each grade level for planned instruction in art, music, and physical education.

Sample schools were found to exceed the standard of 200 minutes. They had a mean time of 212 minutes per week for the identified classes.
APPENDIX B

LIST OF SAMPLE SCHOOLS
OHIO SCHOOLS IN CITY DISTRICTS

David H. Maxwell, Principal
Parkway Elementary School
1490 Parkway Blvd.
Alliance City School District
Alliance, Ohio 44601
Stark County
216-821-2100

Beverly DeBlaae, Principal
York Elementary School
Route 1
Bellevue City School District
Clyde, Ohio 43410
Huron County
419-483-2320

Ann Doddridge, Principal
Riveredgc Elementary School
224 Emerson Drive
Berea City School District
Berea, Ohio 44017
Cuyahoga County
216-234-0900

Dave Nicholls, Principal
Lincoln Elementary School
301 East Butler Street
Bryan City School District
Bryan, Ohio 43506
Williams County
419-636-6931

Anthony Jefferson, Principal
Garfield Elementary School
South Seventh Street
Cambridge City School District
Cambridge, Ohio 43725
Guernsey County
614-439-5021

Frank Richards, Principal
Gordon Intermediate School
100 Gordon Avenue
Campbell City School District
Campbell, Ohio 44405
Mahoning County
216-755-2311

Audrey M. Sparks, Principal
Gibbs Elementary School
1320 Gibbs Avenue, N.E.
Canton City School District
Canton, Ohio 44705
Stark County
216-456-1521

Delores Vehar, Principal
Oxford Elementary School
939 Quilliams Road
Cleveland Hts. - University Hts. City School District
Cleveland Heights, Ohio 44121
Cuyahoga County
216-371-7115

Joyce A. Shellhammer, Principal
West Main Elementary School
836 Main Street
Conneaut Area City School District
Conneaut, Ohio 44030
Ashtabula County
216-599-8135

Joanne Parkas, Principal
Arrowhead Primary School
1600 Raleigh Blvd.
Copley-Fairlawn City School District
Copley, Ohio 44321
Summit County
216-666-6501

Joan Gula, Principal
Sliver Lake Elementary School
2970 Overlook Road
Cuyahoga Falls City School District
Cuyahoga Falls, Ohio 44224
Summit County
216-920-3632

Jerry Latta, Principal
Brickell Elementary School
601 East Second Street
Defiance City School District
Defiance, Ohio 43512
Defiance County
419-782-9909

Patricia M. Bohmer, Principal
James Conger Elementary School
10 Channing Street
Delaware City School District
Delaware, Ohio 43015
Delaware County
614-363-7731

Paul E. Smith, Principal
Parkview Elementary School
21520 Mastick Road
Fairview Park City School District
Fairview Park, Ohio 44126
Cuyahoga County
216-734-1188
OHIO SCHOOLS IN CITY DISTRICTS

(Cont'd.)

JoAnn T. Reeds, Principal
Lincoln Elementary School
200 West Lincoln Street
Findlay City School District
Findlay, Ohio 45840
Hancock County
419-422-6121

Kenneth Goshe, Principal
Riley Elementary School
Corner Walnut and Thomas
Fostoria City School District
Fostoria, Ohio 44830
Seneca County
419-435-2100

Anne Dowd, Principal
William C. Schenck Elementary School
350 Arlington Avenue
Franklin City School District
Franklin, Ohio 45005
Warren County
513-743-8665

Daniel Lister, Principal
Chapelfield Elementary School
280 Chapelfield Road
Gahanna-Jefferson City School District
Gahanna, Ohio 43230
Franklin County
614-478-5575

Alfred C. Fairchild, Principal
Wilma Crall Elementary School
702 South Boston Street
Galion City School District
Galion, Ohio 44833
Crawford County
419-468-1507

Harvey Cobbs, Principal
Jefferson Elementary School
Eighth and Chestnut Streets
Hamilton City School District
Hamilton, Ohio 45011
Butler County
513-894-6261

Charles Walters, Principal
West Ironton Elementary School
Third and Elm Streets
Ironton, Ohio 45638
Lawrence County
614-532-4229

Patricia Stiles, Principal
Northwood Elementary School
530 North Gilmore Street
Kenton City School District
Kenton, Ohio 43326
Hardin County
419-673-4294

Nancy G. Karabinus, Principal
Taft Elementary School
13701 Lake Avenue
Lakewood, Ohio 44107
Cuyahoga County
216-529-4254

Charlotte A. Miller, Principal
Francis Dunlavy Elementary School
Water Street
Lima City School District
Lima, Ohio 45804
Allen County
419-227-6001

Lester S. Noble, Principal
Lockland Elementary School
200 North Cooper Avenue
Lockland City School District
Lockland, Ohio 45215
Hamilton County
513-563-8130

Jean Holte, Principal
Raymond Elementary School
18500 Raymond Street
Maple Heights City School District
Maple Heights, Ohio 44137
Cuyahoga County
216-662-7525

Joseph R. Toller, Principal
Phillips Elementary School
Pike and Elmwood
Marietta City School District
Marietta, Ohio 45750
Washington County
614-373-2747
OHIO SCHOOLS IN CITY DISTRICTS

(Cont'd.)

Anthony Collette, Principal
Hilltop Elementary School
Route 2
Martina Ferry City School District
Dillonvale, Ohio 43917
Belmont County
614-635-2444

Edwin J. Helminger, Principal
Fort Miami Elementary School
716 Askin Street
Maumee City School District
Maumee, Ohio 43537
Lucas County
419-893-2201

Douglas Moser, Principal
Ella Canavan Elementary School
825 Lawrence Street
Medina City School District
Medina Ohio 44256
Medina County
216-725-8831

Gary L. Ritchey, Principal
West Elementary School
Clairmont Street
Napoleon City School District
Napoleon, Ohio 43545
Huron County
419-592-4641

Charles J. Radich, Principal
Northwood Elementary School
2525 Hume Street
North Canton City School District
North Canton, Ohio 44720
Stark County
216-499-4481

Sue Oswald, Principal
Spruce Elementary School
28590 Windsor Drive
North Olmsted City School District
North Olmsted, Ohio 44070
Cuyahoga County
216-777-9903

James Eischbach, Principal
Harman Elementary School
735 Harman Avenue
Oakwood City School District
Dayton, Ohio 45419
Montgomery County
513-297-5338

Kenneth Bogard, Principal
Portage Elementary School
Lake Street and State Route 2
Port Clinton City School District
Gypsum, Ohio 43433
Ottawa County
419-734-2812

Shirley McEvoy, Principal
Moulton Elementary School
Rural Route 2, Box 118
St. Marys City School District
Wapakoneta, Ohio 45895
Auglaize County
419-394-4846

Thomas Cupples, Principal
Prospect Elementary School
836 Prospect Street
Salem City School District
Salem, Ohio 44460
Columbiana County
216-332-4621

Judith B. Monaghan, Principal
Osborne Elementary School
920 West Osborne Street
Sandusky City School District
Sandusky, Ohio 44870
Erie County
419-626-6940

Sharon Benz, Principal
Rowland Elementary School
4300 Bayard Road
South Euclid-Lyndhurst City School District
South Euclid, Ohio 44121
Cuyahoga County
216-382-7707

Pamela R. Young, Principal
Snowhill Elementary School
531 West Harding Road
Springfield City School District
Springfield, Ohio 45504
Clark County
513-328-2051

Myron Gray, Principal
Indian Trail Elementary School
3512 Kent Road
Stow City School District
Stow, Ohio 44224
Summit County
216-688-6481
Ohio Schools in City Districts

(Cont'd.)

Virginia A. Patton, Principal  
Wait Elementary School  
899 Frost Road  
Streetsboro City School District  
Streetsboro, Ohio 44241  
Portage County  
216-653-6088

Michael Jenoff, Principal  
Center Elementary School  
75 Center Road  
Struthers City School District  
Struthers, Ohio 44471  
Mahoning County  
216-750-1061

Jacqueline Mallett, Principal  
Stranahan Elementary School  
3840 Holland-Sylvania Road  
Sylvania City School District  
Toledo, Ohio 43615  
Lucas County  
419-882-0555

Stephen Price, Principal  
McGuffey Elementary School  
Spring at Campus  
Talawanda City School District  
Oxford, Ohio 45056  
Butler County  
513-523-7646

Bonnie J. Sloan, Principal  
Edgewater Elementary School  
5549 Edgewater Drive  
Toledo City School District  
Toledo, Ohio 43611  
Lucas County  
419-726-2254

Brenda Riley, Principal  
North Elementary School  
626 North Russell Street  
Urbana City School District  
Urbana, Ohio 43078  
Champaign County  
513-653-7746

Thomas E. Shumate, Principal  
Franklin Elementary School  
148 Chestnut Street  
Wadsworth City School District  
Wadsworth, Ohio 44281  
Medina County  
216-336-3571

Richard L. Swartzmiller, Principal  
Pointview Elementary School  
720 Pointview Drive  
Westerville City School District  
Westerville, Ohio 43081  
Franklin County  
614-893-6084

Barbara J. Gardecki, Principal  
Shade Elementary School  
510 East Pease Avenue  
West Carrollton City School District  
West Carrollton, Ohio 45449  
Montgomery County  
513-859-4061

Gerald A. Janosko, Principal  
Greenfield Elementary School  
State Route 162  
Willard City School District  
Monroe, Ohio 44847  
Huron County  
419-935-5341

Nancy J. Bradley, Principal  
Jefferson Elementary School  
36010 Lake Shore Blvd.  
Willoughby-Eastlake City School District  
Eastlake, Ohio 44094  
Lake County  
216-942-7244

Willard Allen, Principal  
Roy E. Holmes Elementary School  
State Route 730  
Wilmington City School District  
Wilmington, Ohio 45177  
Clinton County  
513-382-2750

Lewis Stern, Principal  
Parkview Elementary School  
773 Parkview  
Wooster City School District  
Wooster, Ohio 44691  
Wayne County  
216-262-3821

Pamela Mayo, Principal  
Simon Kenton Elementary School  
1087 West Second Street  
Xenia City School District  
Xenia, Ohio 45385  
Greene County  
513-372-9251
OHIO SCHOOLS IN EXEMPTED VILLAGE DISTRICTS

Frank Koci, Principal
Barnesville Elementary School
210 West Church Street
Barnesville Exempted Village
School District
Barnesville, Ohio 43713
Belmont County
216-425-3639

Larry J. Benenzer, Principal
West Elementary School
220 North First Street
Coldwater Exempted Village
School District
Coldwater, Ohio 45828
Mercer County
419-678-2613

William L. Horning, Principal
Crestline Middle School
215 North Columbus Street
Crestline Exempted Village
School District
Crestline, Ohio 44827
Crawford County
419-683-1966

James E. Knapp, Principal
Granville Elementary School
310 North Granger Street
Granville Exempted Village
School District
Granville, Ohio 43023
Licking County
614-587-0402

Nellie Wile, Principal
Perrysville Elementary School
155 West Third Street
Loudonville-Perrysville Exempted
Village School District
Perrysville, Ohio 44864
Ashland County
419-938-7193

Gayle Shaw Cramer, Principal
Fairfax Elementary School
6465 Curtiss Court
Mantor Exempted Village
School District
Mantor, Ohio 44060
Lake County
216-255-7223

Joyce A. Richardson, Principal
Milford South Elementary School
777 Garfield
Milford Exempted Village
School District
Milford, Ohio 45150
Clermont County
513-831-6570

Nicky E. Donaldson, Principal
Milton-Union Elementary School
43 Wright Road
Milton-Union Exempted Village
School District
West Milton, Ohio 45383
Miami County
513-698-6789

Darold K. Figgins, Principal
Superior Elementary School
Route 3
Montpelier Exempted Village
School District
Montpelier, Ohio 43543
Williams County
419-485-5346

Richard Forsythe, Principal
East Elementary School
College Street
Newcomerstown Exempted Village
School District
Newcomerstown, Ohio 43832
Tuscarawas County
614-498-4151

Carole Liebich, Principal
Toth Elementary School
200 East Seventh Street
Perrysburg Exempted Village
School District
Perrysburg, Ohio 43551
Wood County
419-874-3123

Adrienne Howell, Principal
Nevin Coppock Elementary School
525 North Hyatt Street
Tipp City Exempted Village
School District
Tipp City, Ohio 45371
Miami County
513-667-2275
OHIO SCHOOLS IN EXEMPTED VILLAGE DISTRICTS

(Cont’d.)

Sandra J. Ludwig, Principal
Union Building Elementary School
390 West Walker Street
Upper Sandusky Exempted Village
School District
Upper Sandusky, Ohio 43351
Wyandot County
419-294-2586

Randall Newsome, Principal
Mills Lawn Elementary School
Walnut Street
Yellow Springs Exempted Village
School District
Yellow Springs, Ohio 45387
Greene County
513-767-7217

OHIO LOCAL SCHOOLS IN COUNTY SYSTEMS

Daniel Aahbaugh, Principal
Polk Elementary School
Mapleton Local School District
Polk, Ohio 44866
Ashland County
419-945-2101

Robert McClure, Principal
Hustead Elementary School
3600 Hustead Road
Mad River-Green Local School District
Springfield, Ohio 45502
Clark County
513-328-5360

Mary J. Taylor, Principal
North Kingsville Elementary School
1343 East Center Street
Buckeye Local School District
North Kingsville, Ohio 44068
Ashtabula County
216-224-0281

Margaret McAtee, Principal
Park Layne Elementary School
620 Cliffside
New Carlisle-Bethel Local School District
New Carlisle, Ohio 45344
Clark County
513-849-0993

Robert Dravesky, Principal
Pymatuning Valley Middle School
Route 6 W
Pymatuning Valley Local School District
Andover, Ohio 44003
Ashtabula County
216-293-6981

Cynthia Fisher, Principal
Rolling Hills Elementary School
2613 Moorfield Road
Northeastern Local School District
Springfield, Ohio 45502
Clark County
513-399-2250

John U. Crunelle, Principal
Jefferson Avenue Elementary School
Jefferson Avenue
Shadyside Local School District
Shadyside, Ohio 43947
Belmont County
614-676-9669

Rick L. Fry, Principal
Miami View Elementary School
230 Old Clifton Road
Southeastern Local School District
South Charleston, Ohio 45368
Clark County
513-462-8364

David R. Tobergte, Principal
Liberty Elementary School
6040 Princeton Park
Lakota Local School District
Hamilton, Ohio 45011
Butler County
513-777-6194

Paul Sallada, Principal
Batavia Elementary School
215 Broadway
Batavia Local School District
Batavia, Ohio 45103
Clermont County
513-732-0780
Richard Christoff, Principal
Lake Milton Elementary School
16670 Milton Avenue
Jackson-Milton Local School District
Lake Milton, Ohio 44429
Mahoning County
216-538-2312

Robert Winn, Principal
F. A. Sebring Elementary School
306 West Texas Avenue
Sebring Local School District
Sebring, Ohio 44672
Mahoning County
216-938-2326

Donald Bobovnik, Principal
South Range West Intermediate
Box 86
South Range Local School District
Greenford, Ohio 44422
Mahoning County
216-938-3335

Gerald Kotchmar, Principal
New Middletown Elementary School
10580 Main Street
Springfield Local School District
New Middletown, Ohio 44442
Mahoning County
216-542-3722

David Philibin, Principal
Maple Ridge Elementary School
13444 Bandy Road
West Branch Local School District
Alliance, Ohio 44601
Mahoning County
216-821-7601

Joyce Galieti, Principal
Ellsworth Elementary School
6194 Warren-Salem Road
Western Reserve Local School District
Ellsworth, Ohio 44416
Mahoning County
216-538-3663

Bruce Cast, Principal
Pleasant Elementary School
1105 Owens Road West
Pleasant Local School District
Marion, Ohio 43302
Marion County
614-389-4815

Carla Thomas, Principal
Litchfield Elementary School
9339 Brooker Street
Buckeye Local School District
Litchfield, Ohio 44253
Medina County
216-722-1222

Timothy Burns, Principal
Westfield Elementary School
9055 South Leroy Road
Cloverleaf Local School District
Westfield Center, Ohio 44251
Medina County
216-948-2500

Wendy Halar, Principal
Salisbury Elementary School
41675 Pomeroy Pike
Meigs Local School District
Pomeroy, Ohio 45769
Meigs County
614-992-3404

Carl E. Hart, Principal
Burkettsville Elementary School
Main Street
St. Henry Consolidated Local School District
Burkettsville, Ohio 45310
Morrow County
419-375-2845

Robert B. Pohlmeier, Principal
New Lebanon Elementary School
1150 West Main Street
New Lebanon Local School District
New Lebanon, Ohio 45345
Montgomery County
513-687-3511

Richard J. Cullen, Principal
Cardington Elementary School
Nichols Street
Cardington-Lincoln Local School District
Cardington, Ohio 43315
Morrow County
419-864-6692

Michael Carder, Principal
Highland East Elementary School
Box 69
Highland Local School District
Sparta, Ohio 43350
Montgomery County
419-768-3040
Ohio Local Schools in County Systems

(Cont'd.)

Louis E. Meeks, Principal
Johnsville Elementary School
Northmor Local School District
Shauck, Ohio 43349
Morrow County
419-362-2161

Nicholas Anspach, Principal
Thornville Elementary School
Box 246
Northern Local School District
Thornville, Ohio 43076
Perry County
614-246-6636

Scott Wilson, Principal
Saltcreek Elementary School
13190 State Route 56 East
Logan Elm Local School District
Kingston, Ohio 45644
Pickaway County
614-332-4212

Carol S. Hatem, Principal
Ashville Elementary School
190 Plum Street
Teays Valley Local School District
Ashville, Ohio 43103
Pickaway County
614-983-2921

Ted Poole, Principal
Hiram Elementary School
8745 Bancroft
Crestwood Local School District
Hiram, Ohio 44234
Portage County
216-356-7515

John R. Giles, Principal
Fort Jennings Elementary School
130 West Second Street, P.O. #187
Jennings Local School District
Fort Jennings, Ohio 45844
Putnam County
419-286-2762

William Collier, Principal
Rosemount Elementary School
Rose Valley Road
Clay Local School District
Portsmouth, Ohio 45662
Scioto County
614-353-0272

James W. Kelbley, Principal
Bettsville Elementary School
Box 6
Bettsville Local School District
Bettsville, Ohio 44815
Seneca County
419-986-5561

Comer L. Carey, Principal
Attica Elementary School
Seneca East Local School District
Attica, Ohio 44807
Seneca County
419-426-3344

Roy Jarvis, Principal
Fairlawn Elementary School
P.O. Box 24
Fairlawn Local School District
Pemberton, Ohio 45353
Shelby County
513-492-1654

Raymond Asher, Principal
Lexington Elementary School
12333 Atwater N.E.
Marlington Local School District
Alliance, Ohio 44601
Stark County
216-821-4474

Stephen L. Snyder, Principal
Woodridge Elementary School
3313 Northampton Road
Woodridge Local School District
Cuyahoga Falls, Ohio 44223
Summit County
216-928-1223

John Young, Principal
Addison Elementary School
900 Judson Road
Brookfield Local School District
Masury, Ohio 44438
Trumbull County
216-448-8132

Danice Bowser, Principal
Bristol Elementary School
1845 Greenville Road N.W.
Bristol Local School District
Bristolville, Ohio 44402
Trumbull County
216-889-2700
OHIO LOCAL SCHOOLS IN COUNTY SYSTEMS

(Cont'd.)

Carter Cordes, Principal
Miamitown Elementary School
State and Mill Street
Southwest Local School District
Miamitown, Ohio 45041
Hamilton County
513-353-1416

Timothy R. Kruse, Principal
Liberty-Benton Elementary School
9050 State Route 12 West
Liberty-Benton Local School District
Findlay, Ohio 45840
Hancock County
419-422-9161

Sharon R. Bechtel, Principal
Hardin Northern Elementary School
11589 State Route 81
Hardin Northern Local School District
Dola, Ohio 45835
Hardin County
419-759-3158

Ronald E. Hull, Principal
Ridgemont Elementary School
West Taylor Street
Ridgemont Local School District
Mt. Victory, Ohio 43340
Hardin County
513-354-2141

Terry W. Bobbitt, Principal
Mount Blanchard Elementary School
Riverdale Local School District
Mt. Blanchard, Ohio 45867
Hardin County
419-694-2123

Keith A. McGinnis, Principal
Roundhead Elementary School
Upper Scioto Valley Local School District
Roundhead, Ohio 43346
Hardin County
513-462-6753

Dale Rawlins, Principal
Kenneth W. Lewis Elementary School
1426 State Route 140
Oak Hill Union Local School District
Oak Hill, Ohio 45656
Jackson County
614-682-7096

Ruth Stevenson, Principal
Hadden Elementary School
1800 Mentor Avenue
Painesville Local School District
Painesville, Ohio 44077
Lake County
216-354-4414

James A. Riley, Principal
Hebron Elementary School
705 Deacon Street
Lakewood Local School District
Hebron, Ohio 43025
Licking County
614-928-2661

Theresa A. Zeyen, Principal
Northridge Homer Elementary School
1227 Homer Road, N.W.
Northridge Local School District
Homer, Ohio 43027
Licking County
614-892-3636

Mary Jane Underwood, Principal
Pataskala Elementary School
395 South High Street
Southwest Licking Local School District
Pataskala, Ohio 43062
Licking County
614-927-3861

Jon Fenton, Principal
Monroe Elementary School
5000 State Route 38
Jonathen Alder Local School District
London, Ohio 43140
Madison County
614-857-1712

Terry Samuels, Principal
West Boulevard Elementary School
6125 West Blvd.
Boardman Local School District
Youngstown, Ohio 44512
Mahoning County
216-758-2144

Herbert Bartelmay, Principal
Hilltop Elementary School
400 Hilltop Blvd.
Canfield Local School District
Canfield, Ohio 44406
Mahoning County
216-533-9806
OHIO LOCAL SCHOOLS IN COUNTY SYSTEMS

(Charla Swindler, Principal
North Road Elementary School
863 North Road S.E.
Howland Local School District
Warren, Ohio 44484
Trumbull County
216-856-5971

Allan Runnel, Principal
Vernon Elementary School
6144 Yo Connecticut Road
Joseph Badger Local School District
Kinsman, Ohio 44428
Trumbull County
216-772-4731

Philip E. Ginnetti, Principal
Lordstown Elementary School
6540 South Todd Avenue S.W.
Lordstown Local School District
Warren, Ohio 44481
Trumbull County
216-824-2572

Beverly R. Hoagland, Principal
Maplewood East Elementary School
4174 Greenville Road N.E.
Maplewood Local School District
Cortland, Ohio 44410
Trumbull County
216-924-2431

Harry Kirsch, Principal
Seaborn Elementary School
Niles Carver
Weathersfield Local School District
Mineral Ridge, Ohio 44440
Trumbull County
216-652-9695

Larry L. Miller, Principal
Ragersville Elementary School
Route 1
Garaway Local School District
Sugarcreek, Ohio 44681
Tuscarawas County
216-897-5021

Ed Bode, Principal
Strasburg-Franklin Elementary School
140 North Bodmer
Strasburg-Franklin Local School District
Strasburg, Ohio 44680
Tuscarawas County
216-878-5571

Fred Pedersen, Principal
New Cumberland Elementary School
Route 1 Mineral City
Tuscarawas Valley Local School District
Mineral City, Ohio 44656
Tuscarawas County
216-343-7090

Kenneth B. Jerome, Principal
Crestview South Elementary School
Crestview Local School District
Wren, Ohio 43899
Van Wert County
419-495-2101

Rodney L. Dudgeon, Principal
Ohio City-Liberty Elementary School
P.O. Box 217 - Shane Street
Ohio City-Liberty Local School District
Ohio City, Ohio 45874
Van Wert County
419-965-2131

James Romich, Principal
Saleski Elementary School
Vinton County Local School District
Zaleski, Ohio 45698
Vinton County
614-596-5617

Kenneth L. Smith, Principal
South Lebanon Elementary School
10 North High Street
Kings Local School District
South Lebanon, Ohio 45065
Warren County
513-494-1105

Kenneth Oliver, Principal
Morrow Elementary School
10 Miranda Street
Little Miami Local School District
Morrow, Ohio 45152
Warren County
513-899-2741

Terry Bauman, Principal
Smithville Elementary School
156 North Milton Street
Green Local School District
Smithville, Ohio 44677
Wayne County
216-669-3501
OHIO LOCAL SCHOOLS IN COUNTY SYSTEMS

(Cont'd.)

David Weidner, Principal
Ebon C. Hill West Elementary School
State Route 232
Bethel-Tate Local School District
Bethel, Ohio 45106
Clermont County
513-734-4025

Glenn Trout, Principal
Clinton-Massie Elementary School
2556 Lebanon Road
Clinton-Massie Local School District
Clarksville, Ohio 45113
Clinton County
513-289-2515

Gary K. Burkle, Principal
Canal Winchester Elementary School
100 Washington Street
Canal Winchester Local School District
Canal Winchester, Ohio 43110
Franklin County
614-837-4616

Marjorie E. Brooks, Principal
Sulphur Springs Elementary School
Colonel Crawford Local School District
Sulphur Springs, Ohio 44881
Crawford County
419-562-7195

William Rowley, Principal
Hamilton Central Elementary School
1105 Rathmall Road
Hamilton Local School District
Columbus, Ohio 43207
Franklin County
614-491-4100

Frank Levering, Principal
Wynford Intermediate School
4401 State Route 19
Wynford Local School District
Bucyrus, Ohio 44820
Crawford County
419-562-4619

Michael Sullivan, Principal
Archbold Elementary School
Holland Street
Archbold-Area Local School District
Archbold, Ohio 43502

Larry L. Conklin, Principal
Mississinawa Valley Elementary School
Route 5
Mississinawa Valley Local School District
Union City, Ohio 45390
Darke County
513-968-5300

Richard G. Householder, Principal
Claridon Elementary School
14818 Mayfield Road
Berkshire Local School District
East Claridon, Ohio 44033
Geauga County
216-635-5311

James Kline, Principal
Sherwood Elementary School
Box 248
Central Local School District
Sherwood, Ohio 43556
Defiance County
419-899-2108

Susan Miller, Principal
Muson Elementary School
12687 Bass Lake Road
Chardon Local School District
Chardon, Ohio 44024
Geauga County
216-286-5901

Patricia G. Seeholzer, Principal
Kelleys Island Consolidated School
Box 349
Kelleys Island Local School District
Kelleys Island, Ohio 43438
Erie County
419-746-2730

Keith Earley, Principal
Greenview South Elementary School
5619 Hussey Road
Greenview Local School District
Bowesville, Ohio 45307
Greene County
513-453-2319
### OHIO LOCAL SCHOOLS IN COUNTY SYSTEMS (Cont'd.)

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<thead>
<tr>
<th>School</th>
<th>Address</th>
<th>Phone</th>
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<tr>
<td>Charles Roberts, Principal</td>
<td>Edgerton Elementary School</td>
<td>419-298-2332</td>
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<tr>
<td>Edgerton Local School District</td>
<td>Edgerton, Ohio 43517</td>
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<td>Williams County</td>
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<td>Thomas Balser, Principal</td>
<td>North Central Elementary School</td>
<td>419-737-2293</td>
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<tr>
<td>North Central Local School District</td>
<td>Kunkle, Ohio 43531</td>
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<td>Williams County</td>
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<tr>
<td>James Selgo, Principal</td>
<td>Stryker Elementary School</td>
<td>419-682-2841</td>
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<td>Stryker Local School District</td>
<td>Stryker, Ohio 43557</td>
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<td>Williams County</td>
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<td>Thomas E. Mangold, Principal</td>
<td>Lake Elementary School</td>
<td>419-246-3689</td>
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<td>Lake Local School District</td>
<td>Lemoyne Road</td>
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<td>Williams County</td>
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<tr>
<td>Gary L. Ogg, Principal</td>
<td>E.A. Powell Elementary School</td>
<td>419-257-2124</td>
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<tr>
<td>North Baltimore Local School District</td>
<td>North Baltimore, Ohio 45872</td>
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<td>Williams County</td>
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<tr>
<td>James Robarge, Principal</td>
<td>Weston Elementary School</td>
<td>419-669-3754</td>
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<tr>
<td>Weston Local School District</td>
<td>Weston, Ohio 43569</td>
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<td>Williams County</td>
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</table>
APPENDIX C

QUESTIONNAIRE
FOURTH GRADE CURRICULUM TIME ALLOCATIONS

INSTRUCTIONS:

It is estimated that 20 minutes will be required to complete the questionnaire. Check the response that best describes your school, unless the question directs you to do otherwise. Place your completed questionnaire in the self-addressed return envelope. Thank you very much for participating.

Demographic Data

1. The population category of your school location is:
   - city of 400,000 or more
   - city of 100,000 to 399,999
   - suburban: close to a city over 100,000
   - city between 5,000 and 100,000
   - small town, under 5,000
   - rural

2. The number of students in your elementary school is:
   - 1-199
   - 200-499
   - 500-999
   - 1,000 or over

3. What is the average class size of the grades listed below?
   - 14 or less
   - 15-20
   - 21-26
   - 26-30
   - 31 or over

Fourth
Time Allotment

1. What is the length of the student instructional day in your school, exclusive of lunch and recess time?

   ___ 5 hours or less   ___ 5 1/4   ___ 5 1/2   ___ 5 3/4
   ___ 6   ___ 6 1/4   ___ more than 6 1/2

2. How many student instructional days are there each year?

3. Below are standard curriculum areas for which time is allocated in elementary schools. How many minutes per week are allocated to each area in the fourth grade? For example, if mathematics is required 40 minutes each day, the time to record is 200 minutes. Enter "0" if the area is not taught. If subjects are combined (Health/Physical Education or Science/Social Studies), please estimate the minutes for each subject separately.

   Curriculum

   (1) Minutes per week allocated in fourth grade

   A. _______ Reading/Language Arts
   B. _______ Mathematics
   C. _______ Science
   D. _______ Social Studies
   E. _______ Physical Education
   F. _______ Health
   G. _______ Art
   H. _______ Music
   I. _______ Recess
   J. _______ Lunch
   K. _______ Other (list subject by title)
   _______
**Achievement**

What is the average standard score on the Iowa Test of Basic Skills for each fourth grade class in Reading and Mathematics?

<table>
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<tr>
<th>Reading Score</th>
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<td>Class 1 _____</td>
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<td>Class 4 _____</td>
</tr>
<tr>
<td>Class 5 _____</td>
<td>Class 5 _____</td>
</tr>
</tbody>
</table>

Date when Iowa Test of Basic Skills was administered:

__________________________
Dear Principal:

In the past five years, there has been considerable interest in increasing pupil academic achievement. The amount of time pupils spend involved in academic subjects has been identified as a key element. The purpose of this study is to examine how Ohio allocated time affects pupil academic performance in Ohio schools. In order to complete the study, your assistance is needed.

Please take a few moments from your busy schedule to complete the enclosed questionnaire. Let me assure you that no individual or school will be identified as a result of the study.

A summary of the research findings will be provided upon request. Should you like a summary, please write "Summary Requested" on the outside of the return envelope. Thank you for your assistance.

Sincerely,

Robert L. Moore
Ph.D. Candidate
Ohio State University

Advisor: Dr. Luvern Cunningham
May 20, 1987

Dear Principal:

On April 15 I mailed a questionnaire to you and requested your assistance in completing a research project on the academic achievement of Ohio elementary students.

As of today, I have not received the completed questionnaire. Please take a few minutes from your busy schedule to complete the enclosed questionnaire. Let me assure you that no individual or school will be identified as a result of the study.

A summary of the research findings will be provided upon request. Should you like a summary, please write "Summary Requested" on the outside of the return envelope. Thank you for your assistance.

Sincerely,

Robert L. Moore
Ph.D. Candidate
Ohio State University
Advisor: Dr. Luvern Cunningham

RLM/1a
Enclosure