A COMPARISON OF ATTITUDES AND SKILLS OF CHILDREN TAUGHT BY THE PHYSICAL EDUCATION SPECIALIST FIVE DAYS A WEEK AND THOSE TAUGHT BY THE PHYSICAL EDUCATION SPECIALIST ONE DAY A WEEK

A Thesis

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CHAPTER I

INTRODUCTION

The explanation for differences in performance level among children with apparently equal innate capacities have long been sought by educators and others interested in solving the mysteries of learning and behavior. The measurement of these innate capacities can be assessed, described in measurable terms and can be examined and compared. The factors other than the innate capacities must be held accountable for differences in abilities when biological capacities are considered to be equal. Educators, psychologists, and social psychologists have been led into the search for added determinants of behavior and performance. Bowman states:

> In the field of education, "motivation" and "attitude" were common labels attached to the qualities of (or in) the individual which accounted for his behavior in a given situation. Attitude, in this sense, was used as a general term referring to the way the individual felt, his likes, dislikes, reactions, and interest or disinterest in a particular object or area. Motivation was used most frequently to denote the desire to act.[1]

Physical educators have long been interested in the attitudes of students toward physical education and the factors that contribute to the formation of these attitudes. Interest has also been evidenced in how and to what degree physical education experiences influenced the

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[1]Mary Olive Bowman, "The Relationship Between Student and Parent Attitudes and Skill of Fifth Grade Children" (unpublished Doctorial dissertation, State University of Iowa, Iowa City, Iowa, 1958), p. 2.

development of various attitudes.[2] The development of self-motivation and self-direction of the individual is the goal of all educational programs. It is necessary to develop attitudes favorable to the direction toward which the individuals should move if this goal is to be achieved.[3]

Professional literature contains numerous studies which have established that attitudes serve as the motivating media to condition a student's use of skills and knowledge which have been learned. Allport[4] has defined attitude as the mental and neutral state of readiness.

An explanation for differences in performance levels on complex motor skills among children of the same chronological age is provided by the difference in physiological maturity. However, it does not explain the difference in performance on simple motor tasks. Bowman[5] states that the activity pattern of the child may be influenced by such factors as physical environment and the child's own reactions to given experiences.

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[2]Marilyn F. Vincent, "Attitudes of College Women Toward Physical Education and Their Relationship to Success in Physical Education," Research Quarterly, XXXVIII (March, 1967), p. 126.

[3]Donald E. Campbell, "Wear Attitude Inventory Applied to Junior High School Boys," Research Quarterly, XXXIX (December, 1968), p. 888.

[4]G. W. Allport, Attitudes: A Handbook of Social Psychology (Worcester, Massachusetts: Clark University Press, 1935).

[5]Bowman, op. cit., p. 5.

Teachers of physical education must help pupils acquire attitudes and appreciations which then serve as motivating devices that condition a student's orientation to the use of learned skills, knowledges, and understandings. Within the elementary school physical education program wide variations of attention are given to each of the objectives of organic development, neuromuscular development, and social-emotional development.

The development of physical skills is the natural desire to learn skills which appears to be present at the elementary age. Nash writes, "The child has skill hungers which should be appeased in the crucial skill learning decade."[6]

A number of studies have been conducted to determine general attitudes toward physical education, athletic competition, and special conditioning classes. In recent years, there has been the increased emphasis in determining the comparisons of selected skills of students taught by the physical education specialist and those taught by the classroom teacher. Most of the research involving teaching of students in physical education by the physical education specialist and by the classroom teacher has been conducted in conjunction with selected skills. Few studies have been done to determine the differences between student attitudes and skills of those children taught by the classroom teacher and those children taught by the physical education specialist.

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[6]J. B. Nash, "The Skill-Learning Years," Yearbook of the American Association for Health, Physical Education and Recreation (New York: World Book Company, 1950), p. 65.

It was for this reason and the interest the researcher had in determining attitudes towards physical education and skills in physical education of children taught by the physical education specialist five days a week and those children taught by the physical education specialist one day a week that this study was conducted.

I. STATEMENT OF THE PROBLEM

The purpose of this study was to determine if any differences exist between attitudes toward physical education and skill in physical education of elementary school children taught by the physical education specialist five days a week and attitudes toward physical education and skills in physical education of elementary school children taught by the combined teaching of the physical education specialist one day a week and the classroom teacher four days a week.

Sub-Problems

The following sub-problems were investigated:

1. Was there a difference in attitudes of girls taught by the specialist five days a week and of girls taught by the specialist one day a week.

2. Was there a difference in skills of girls taught by the specialist five days a week and of girls taught by the specialist one day a week.

3. Was there a difference in attitudes of boys taught by the specialist five days a week and of boys taught by the specialist one day a week.

4. Was there a difference in skills of boys taught by the specialist five days a week and of boys taught by the specialist one day a week.

5. To determine if those children who have high attitudes in physical education will also have high skills in physical education.

6. To determine if those children who have low attitudes in physical education will also have low skills in physical education.

II. DEFINITIONS OF TERMS

Physical education specialist. For the purpose of this study, the physical education specialist was defined as a teacher teaching primarily in the area of physical education.

Attitude. An attitude was an individual and mental process which determined both the actual and potential responses of each person in the social world. Since an attitude is always directed toward some object, it may be defined as a state of mind of the individual toward a value.[7]

Skill. Skill was that element of performance that enabled the performer to accomplish a large amount of work with a relatively small amount of effort. Skill is acquired mainly through a refinement of the coordination of different muscle groups.[8]

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[7] Allport, loc. cit.

[8] Laurence E. Morehouse and Augustus T. Miller, Physiology of Exercise (Saint Louis: The C. V. Mosby Company, 1963), p. 50.

III. HYPOTHESIS

It is hypothesized that there are no significant differences in attitudes towards physical education between children taught by the specialist in physical education five days a week and children taught by the specialist in physical education one day a week and the classroom teacher four days a week.

It is further hypothesized that there are no significant differences of skills in physical education between children taught by the specialist in physical education five days a week and children taught by the specialist in physical education one day a week and the classroom teacher four days a week.

IV. LIMITATIONS OF THE STUDY

The researcher limited the study to a pupil attitude inventory in physical education, and selected achievement scales in physical education activities for boys and girls.

The study was further confined to fourth, fifth, and sixth grade boys and girls in two elementary schools in Emporia, Kansas.

CHAPTER II

REVIEW OF THE LITERATURE

In an attempt to better understand some of the factors involved in attitudes toward physical education and skills in physical education of children taught by the physical education specialist five days a week and children taught by the physical education specialist one day a week, the review of previous research was categorized under the following headings: (1) the responsibility of the teacher in the physical education program; (2) the measurement of attitudes related to physical education; (3) the effects of instruction upon the learning of skills; and (4) the effects of different physical education programs upon the accomplishment of motor skills.

I. THE RESPONSIBILITY OF THE TEACHER IN THE PHYSICAL EDUCATION PROGRAM

Bowman[9] states that the activity pattern (behavior) of the child can be attributed to the attitude and motives, beliefs or values of persons who control, affect or influence the behavior of the child. The individual behavior reflects his values and his interpretation of values of other people whom he considers important.

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[9]Bowman, loc. cit.

Workman[10] states that the differences of attention of the objectives of organic development, neuromuscular development, and social-emotional development may rest, to some degree, on whether a specialist in physical education is responsible for the physical education program or whether it is the responsibility of the classroom teacher.

The National Conference on Physical Education for Children of Elementary School Age[11] stressed that the physical education teacher needs knowledge and teaching skill in a variety of activities, must know how to select materials best suited to the needs of a particular group of children, and must be able to adapt activities to the abilities of children and the limitations of facilities.

The use of specialists continues to be debated and tried in various types of organizations at the elementary level. Manley[12] discusses the fact that we have long stressed the need for a strong educational foundation at the elementary level. She states the need for a specialist for the teaching of physical education at the secondary and college levels is supported, while the elementary school child is taught by a teacher with little preparation in physical education.

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[10]Donna Jo Workman, "A Comparison in Selected Skills of Children Taught by the Physical Education Specialist and Those Taught by the Classroom Teacher" (unpublished Doctorial dissertation, State University of Iowa, Iowa City, Iowa, 1965), p. 1.

[11]The Athletic Institute, Physical Education for Children of Elementary School Age, A Report of the National Conference on Physical Education for Children of Elementary School Age (Chicago, 1951), pp. 1-47.

[12]Helen Manley, "The Plight of Elementary School Physical Education," Journal of Health and Physical Education, XIX (May, 1948), p. 335.

Behrensmeyer[13] stressed that the classroom teacher was not professionally prepared in the area of physical education and had too many demands upon her time, while the physical educator could not understand and develop the whole child.

The function of the physical education specialist has changed as more departmentalization and consequently more physical education specialists in the elementary school have developed. The function of the specialists in many school systems late in the nineteenth century was predominately inspectional and administrative. The specialists today are employed in the school as teachers of special subjects or to work with the classroom teacher in an atmosphere of teamwork and cooperation.

Physical educators are concerned as to whether or not the children taught by the specialist come closer to accomplishing the objectives of physical education than those children taught by the classroom teacher. Those who have studied motor performance in early school years propose the possibility that the degree of coordination achieved throughout life depends upon that of preceding years.[14]

The importance of motor skills at the elementary level and to the responsibility of the teacher of physical education are stressed by Jones, Morgan, and Stevens:

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[13]Marguerite Behrensmeyer, "The Special Teacher," Journal of Health, Physical Education and Recreation, XXXIV (November-December, 1963), p. 23.

[14]Ruth B. Glassow and Pauline Druse, "Motor Performance of Girls Age Six to Fourteen Years," Research Quarterly, XXXI (October, 1960), p. 426.

> The teacher of beginning reading and the elementary school teacher of physical education thus face a common task...the responsibility of establishing in the young child the foundation skill that will constantly thereafter provide the means for expanding development of the ability to perform.
>
> The emphasis in primary levels is placed on developing skill for the sake of skill itself. The young child must learn to coordinate the movements of the total body. With this background of ability, the older child can concentrate on the development of skill from the standpoint of its purposeful application to other activities. Thus game skills supply a mental stimulus to the upper elementary child that his younger counterpart neither needs or wants.[15]

II. THE MEASUREMENT OF ATTITUDES RELATED TO PHYSICAL EDUCATION

Most of the common methods of attitude measurement as they affect or are affected by physical education tend to follow a chronological pattern in the degree of interest shown and appear to be represented in literature. The review of literature relating to physical education attitude measurement has been organized according to the methods of assessing attitudes.

Four studies were reported which used the questionnaire or quantitative method of assessing attitudes in 1933. Driftmier[16] used an inventory-checklist to determine individual differences in interest and physical traits of high school girls as they related to physical

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[15] Edwina Jones, Edna Morgan, and Gladys Stevens, Methods and Materials in Physical Education (New York: World Book Company, 1950), p. 20.

[16] Erna Driftmier, "Individual Differences in Interest and Physical Traits as Related to High School Girls in Physical Education," Research Quarterly, III (March, 1933), p. 198.

education. Bullock and Alden[17] attempted to determine the attitude of university freshmen women toward a required physical education program and the reason for these attitudes. Smith[18] used a questionnaire study to compare attitudes of college men participating in a formal physical education program with those participating in an informal program of recreation and intramurals. Blanchard[19] studied the physical education activity likes and dislikes of boys and girls in grades five through eight.

Hazelton and Piper[20] in 1940, conducted a questionnaire to determine the differences with respect to some social traits of students taking individual sports as compared with attitudes of those taking team game activities. The questionnaire was given to 541 freshmen college women. It was concluded that those participating in team sports were higher in certain social elements such as learning to be considerate of others.

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[17]Marguerite Bullock and Florence D. Alden, "Some Factors Determining the Attitudes of Freshmen Women at the University of Oregon Toward Required Physical Education," Research Quarterly, IV (December, 1933), p. 60.

[18]W. R. Smith, "A Questionnaire Study in Regard to the Attitudes of Men Students Toward the Required Physical Education Program," Research Quarterly, IV (March, 1933), p. 246.

[19]V. S. Blanchard, "An Analysis of Likes and Dislikes of Boys and Girls in Health Education Activities," Research Quarterly, IV (March, 1933), p. 239.

[20]Helen W. Hazelton and Junerose Piper, "A Study of Social Values of a Team Game and Two Individual Sports as Judged by the Attitudes of Freshmen College Women," Research Quarterly, XI (March, 1940), p. 54.

Also in 1940, Baker[21] gave a questionnaire survey to 1,150 college women and concluded the attitudes concerning participation in physical education do not regulate participation so much as they reflect the influence of other causes which do.

In 1951, Cowell[22] developed a checklist of attitudes by selecting items from described goals of achievement of high school boys and girls in physical education. The items were based on what was assumed to be the dominant purposes which adolescent youth found strongly motivational. Dawley[23] made an infrequent study of children's attitudes and behavior in physical education. She used anecdotal records of behavior compared with written responses to situational problems to determine the difference between actual reactions to situations and how children said they would react. The test consisted of 15 situations about which 90 questions were asked. Dawley reasoned that "there may be a difference between actual reactions to situations in attitudes of the individual when he pictures himself in a situation and when he is actually in the situation."[24]

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[21]Mary C. Baker, "Factors Which May Influence the Participation in Physical Education of Girls and Women Fifteen to Twenty-Five Years of Age," Research Quarterly, XI (May, 1940), p. 126.

[22]Charles C. Cowell, Arthur S. Daniels, and Harold E. Kenny, "Purposes in Physical Education as Evaluated by Participants, Physical Education Supervisors and Educational Administrators," Research Quarterly, XXII (May, 1951), p. 286.

[23]Dorothy J. Dawley, Maurice E. Trayer, and John H. Shaw, "Relationship Between Observed Behavior in Elementary School Physical Education and Test Responses," Research Quarterly, XXII (March, 1951), p. 71.

[24]Ibid., p. 76.

Jaeger[25] experimented with projective techniques of attitude measurement. She found that the "Picture-Story-Test" designed to measure attitudes toward physical education was not a valid test in terms of criterion measure.

In 1933, Stalnaker[26] made one of the first appearances in literature of the use of a non-disguised-structured attitude scale in physical education. His scale was used to measure attitudes towards intercollegiate athletics. After Stalnaker, the next person to work with the qualitative scale was not until 1945 when Carr[27] developed a scale using the Thurstone-Cave Technique to determine the relationship between success in physical education and selected attitudes of high school freshmen girls. The scale was composed of items relating to environmental and organizational factors relating to physical education, rather than the objectives of the program. The scores of 333 girls on the attitude scale were compared and the conclusion was reached that "attitudes of entering high school freshmen girls influenced their success in physical education."[28]

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[25]Elorise M. Jaeger, "An Investigation of a Projective Test in Determining Attitudes of Prospective Teachers of Physical Education" (unpublished Doctorial dissertation, State University of Iowa, Iowa City, Iowa, 1952).

[26]John Stalnaker, "Attitudes Towards Intercollegiate Athletics," School and Society, XXXVII (April 15, 1933), p. 499.

[27]Martha G. Carr, "The Relationship Between Success in Physical Education in Selected Attitudes Expressed by High School Freshmen Girls," Research Quarterly, XVI (October, 1945), p. 176.

[28]Ibid., p. 191.

McCue[29] used the Thurstone method of scale construction to develop an instrument for evaluating attitudes toward intensive competition in team games. A revision of the McCue scale to make it appropriate for measuring attitudes toward athletic competition in elementary schools was a study by Scott.[30] She concluded that parents tended to have less range in their attitudes and were more favorable as a group toward competition for children than were school administrators or teachers. Parents, in general, were more favorable toward competition for girls than were administrators or teachers.

Plummer[31] used the Likert System to devise an attitude scale to measure the attitude of college women toward physical education. She used 512 subjects and found a correlation of .264 between the scores on the attitude scales and the self-ratings. The relationship between a subject's motor ability and her favorable or unfavorable disposition toward physical education was not high. The final scale was composed of items which affected attitudes and were categorized as: (1) Competition of other activities, (2) finance, (3) personal response to the group, (4) physical appearance, (5) physical education background,

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[29]Betty F. McCue, "Constructing an Instrument for Evaluating Attitudes Toward Intensive Competition in Team Games," Research Quarterly, XXIV (May, 1953), p. 205.

[30]Phebe Scott, "Comparative Study of Attitudes Toward Athletic Competition in Elementary Schools" (unpublished Doctorial dissertation, State University of Iowa, Iowa City, Iowa, 1952).

[31]Tomi C. Plummer, "Factors Influencing the Attitudes and Interests of College Women in Physical Education" (unpublished Doctorial dissertation, State University of Iowa, Iowa City, Iowa, 1952).

(6) physical plant, and (7) selection of requirement.

Wear[32] also used the Likert method in developing a scale to evaluate attitudes toward physical education as an activity course. A self-rating scale was validated by correlating the attitude score with the self-rating score and a coefficient of .80 was obtained. The statements of objectives of physical education was selected as the first list of items. The Wear Attitude Inventory has been used as a measuring device to measure attitudes of college men and college women.

Kappes[33] developed an attitude inventory to measure attitudes toward physical education of women enrolled in the required service courses at Baylor University. The study may be interpreted that attitudes toward physical education as a class is determined by factors other than enjoyment and interest in activity or that enjoyment and interest in physical activity is not related to the objectives of physical education as stated by authorities.

In 1958, Bowman[34] developed an attitude scale to measure attitudes of fifth grade children toward physical activity. She used 127 subjects to develop the pupil activity attitude inventory. The development of the attitude scale consisted of two parts. The first draft was

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[32]Carlos L. Wear, "The Evaluation of Attitude Toward Physical Education as an Activity Course," Research Quarterly, XXII (March, 1951), p. 144.

[33]Evelyne E. Kappes, "Inventory to Determine Attitudes of College Women Toward Physical Education and Student Services of the Physical Education Department," Research Quarterly, XXV (December, 1954), p. 429.

[34]Bowman, op. cit., pp. 1-166.

a questionnaire to thirty-seven activities devised to determine the reactions of children to specific activities. The pupils were asked to select the three items they liked best and the three items they did not like and tell why. Fifty items were selected from the first draft. In the second draft, these fifty items were administered to another group of children. These children marked the fifty items as strongly agree, agree, neutral, disagree, and strongly disagree. Twenty-six items were selected as the final form of the pupil activity inventory.

Bowman concluded that "the methods used to develop a device to measure attitudes of fifth grade pupils toward activity resulted in an adequate instrument for assessing these attitudes among girls, boys, or non-segregated groups."[35]

Other than the study by Bowman, there were no available sources which were directly concerned with the attitudes of children toward physical education activities.

III. THE EFFECTS OF INSTRUCTION UPON THE LEARNING OF SKILLS

Instruction for the development of motor skills by those who teach physical education has been expressed by Mohr.[36] She cites 30 studies at all age levels which uphold the assumption that specific instruction results in learning skills. Studies have been conducted at the elementary school level concerning the development of motor

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[35] Ibid., p. 121.

[36] Dorothy Mohr, "Contributions of Physical Activity to Skill Learning," Research Quarterly, XXXI (May, 1960), p. 321.

skills. Kane[37] gave instructions to 560 children seven, nine, and eleven years of age in the standing broad jump and obtained a mean score of 45.9 inches. He found that 85 per cent of the subjects gave their best performance between the fifth and twelfth trials. Seils,[38] however, gave no instruction in the standing broad jump and obtained a mean score of 36.1 inches.

Miller[39] indicated that first grade children, given instruction in accuracy throwing, do not necessarily improve in skill over and above what is to be expected. Taylor[40] showed that in the standing broad jump and throw for distance in the fifth grade, that the group receiving eight weeks of instruction significantly improved their performance in both activities over the group receiving no instruction.

It appears that the results of most studies done at the elementary school level show that instruction does have a significant effect upon learning of motor skills.

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[37]Robert J. Kane and Howard V. Meredith, "Ability in the Standing Broad Jump of Elementary School Children Seven, Nine, and Eleven Years of Age," Research Quarterly, XXIII (May, 1952), p. 198.

[38]LeRoy Seils, "Relationship Between Measures of Physical Growth and Gross Motor Performance," Research Quarterly, XXII (May, 1951), p. 244.

[39]James L. Miller, "Effect of Instruction on the Development of Throwing Accuracy of First Grade Children," Research Quarterly, XXVIII (March, 1957), p. 132.

[40]Elaine G. Taylor, "A Study to Determine the Influence on Training on Selected Second and Fifth Grade Children in the Throw for Distance and the Standing Broad Jump" (unpublished Master's thesis, University of Wisconsin, 1953).

IV. THE EFFECTS OF DIFFERENT PHYSICAL EDUCATION PROGRAMS UPON THE ACCOMPLISHMENT OF MOTOR SKILLS

Little work has been done on the benefits of participation in physical education programs with the elementary school age. Mohr writes:

> Only 23 studies were located to defend the supposition that skill learning takes place in regular physical education programs. This may be one of the most widely accepted hypotheses in the profession and certainly needs a great deal of supportive research evidence, especially for the general public.[41]

An investigation by Goar[42] upon the effects of participation in the women's physical education program at Wisconsin, showed that the group of college women participating in a one-year physical education program had significant differences in favor of the performance of pull-ups, knowledge of movement, and posture.

Garland[43] studied the effect of participation in a regularly scheduled physical education class upon the athletic performance of boys. The study included 66 elementary school boys divided into two groups: (1) those boys who attended physical education class, and

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[41] Mohr, op. cit., p. 339.

[42] Barbara A. Goar, "A Study of the Effects of Participation in Physical Education on the Performance of College Women in Selected Activities" (unpublished Master's thesis, University of Wisconsin, 1962).

[43] James J. Garland, "The Effect of General Physical Education Upon Athletic Performance," Journal of Physical Education, L (March-April, 1953), p. 87.

(2) those who did not attend class. The National YMCA Athletic Achievement Program which included the basketball throw, pull-ups, potato race, standing broad jump, and target throw for accuracy were used to measure improvement. He concluded that the group having physical education had significantly higher scores on athletic tests after six months.

Rarick and McGee[44] compared third grade children of high motor achievement with those who showed a low level of motor proficiency to determine if factors outside school played a role in determining motor proficiency. They found that the high achievers had more opportunity to participate with parents in play activities in their own homes and more frequently on the playgrounds than did the inferior group.

A study by Kosydar[45] compared the effects of "organized" versus "unorganized" programs of physical education at the elementary school level. He compared fourth, fifth, and sixth grade students in two elementary schools on the basis of fitness measured by the Oregon Motor Fitness Test. One school had a free play period while the other school had an organized physical education program. He gave a pre-test followed by a post-test twelve weeks later and found that children with the organized physical education program had a higher fitness level at

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[44]G. Lawrence Rarick and Robert McGee, "A Study of Twenty Third-Grade Children Exhibiting Extreme Levels on Achievement on Tests of Motor Proficiency," Research Quarterly, XX (May, 1949), p. 145.

[45]Antoni J. Kosydar, "Comparison of Physical Fitness Between Two Elementary Physical Education Programs in the Portland, Oregon, Parochial System" (unpublished Master's thesis, Washington State University, 1962).

the end of twelve weeks. The "organized" program appeared to be better than the "unorganized" program.

Zimmerman[46] compared boys and girls in grade five through eight upon the effectiveness of the physical education specialist and the classroom teacher in the teaching of physical education. The special teachers were former classroom teachers who had taken over the teaching of concentrated programs of physical education, and were not professionally prepared in physical education. She used Neilson and Cozen's technique of classifying children randomly selected from 31 state counties in the State of Illinois by age, height, and weight classifications.

The test items included 50-yard dash, shuttle race, sit-ups, 600-yard walk-run, standing broad jump, pull-ups (boys in grades seven and eight), and modified pull-ups (boys in grades five and six and all girls). In comparing the scores of children taught by the specialist and those taught by the classroom teacher, Zimmerman found that boys taught by the teacher specialized in physical education exceeded the performance of those taught by the classroom teacher in 31 of the 35 group-classification events; and that 20 of these differences were statistically significant at the 5 per cent level of confidence. Girls taught by the specialist exceeded those taught by the classroom teacher

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[46]Helen Zimmerman, "Physical Performance of Children Taught by the Special Teachers and by Classroom Teachers," Research Quarterly, XXX (October, 1959), p. 356.

in 30 of the 35 group-classification events; and 14 of the comparisons were statistically significant.

Zimmerman states that boys and girls taught by the specialist developed greater agility, leg strength, and power than did those boys and girls taught by the clsssroom teacher. She drew the final conclusion that "children taught by the special teachers of physical education exhibit a higher level of physical performance than those taught by the classroom teachers."[47]

Ross[48] studied the comparison of performance scores of those taught by the specialist in physical education and those taught by the non-specialist. She used the Iowa Brace Test in comparing 240 fifth and sixth grade boys and girls; 120 samples randomly selecting five boys and five girls in each grade in six randomly selected schools having a specialist in physical education, and a like sampling of those taught by the classroom teacher. The subjects from the specialist schools were restricted to children who had trained physical education teachers from grade four through six. An analysis of the variance technique were applied to check for significant differences and interactions.

Ross obtained results which showed no significant differences between children taught by the specialist and the non-specialist in any

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[47] Ibid., p. 362.

[48] Bertha Ross, "A Study of the Performance of Girls and Boys Taught by the Specialist and Non-Specialist," Research Quarterly, XXXI (May, 1960), p. 199.

test except the thirty-yard dash which showed the specialist group had significantly better performance scores. Fifth grade boys and girls did not score as well in the short potato race as did the sixth grade boys and girls. In a comparison between sexes, the non-specialist boys scored significantly better than the non-specialist girls on each event. The specialist boys were superior in only one item over the specialist girls; the thirty-yard dash. Ross states that perhaps the girls instructed by the specialist are taught in such a way that their motor performances are more nearly the level of boys.

Ross recommended for future studies that schools be compared where the specialist and non-specialist are not under the same supervisor and do not necessarily follow the same guided program for physical education.

Of the more recent studies, Workman has conducted two studies involving the teaching of physical education by the physical education specialist as compared to the teaching of physical education by the classroom teacher.

In 1965, Workman[49] completed a study to determine if differences exist in the accomplishment of particular skills between children taught by the specialist in physical education and children taught by the classroom teacher. The subjects for the study were sixth graders free of physical handicaps in seventeen different elementary schools in four school districts. An attempt was made to select school districts

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[49]Workman, op. cit., pp. 1-110.

from one metropolitan area. Two of the school districts employed specialists in physical education and the other two school districts did not employ the specialist. The physical education program was the responsibility of the classroom teacher. Some of the schools had physical education handbook guides and others had physical education coordinators. Some of the schools had physical education five times a week for forty minutes each day and others had physical education only three times a week. Each grade had a different teacher for physical education.

Five skill tests were chosen to compare differences in motor achievement of children taught by the specialist and those taught by the classroom teacher. These tests included; softball repeated throws, softball distance throw, standing broad jump, shuttle run, and basketball dribble test. Written test directions and score sheets were provided for the examiners and each of the five tests were thoroughly explained. The softball repeated throws, standing broad jump, and basketball dribble test were administered indoors during February and March. The softball distance throw and the shuttle run were given out-of-doors during the latter half of April and the month of May.

Workman found that girls taught by the specialist performed significantly better on all five tests than did girls taught by the classroom teacher. Boys taught by the specialist scored significantly better on four of the five tests than did boys taught by the classroom teacher. Girls taught by the specialist come closer to reaching the level of performance of boys taught by the specialist than do girls

taught by the classroom teacher in reaching the level of performance of boys taught by the classroom teacher. Finally, girls taught by the specialist surpassed boys taught by the classroom teacher on the softball repeated throws, and scored significantly lower on the softball distance throw and shuttle run.

In another study, Workman[50] compared the performance in selected motor skills between elementary school children taught by the specialist and those taught by the classroom teacher. Here subjects were 200 grade six boys and girls from eight different schools who were taught physical education by the specialist, and 200 grade six boys and girls from nine additional schools who were taught physical education by the classroom teacher. Five tests were administered to subjects in the seventeen elementary schools to measure the skill in ball-handling, running, and jumping. The mean scores of each test were compared separately for boys and girls using the t-test of significance.

Workman found within the limitations of the study, that in skills of ball-handling, running, and jumping, between children taught by the specialist and children taught by the classroom teacher, there were differences in performance. Girls appear to benefit more than boys from instruction by the specialist in physical education.

The amount of difference found in this particular study did not warrant a conclusion that the specialist was more effective than the

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[50]Donna Jo Workman, "Comparison of Performance of Children Taught by the Physical Education Specialist and by the Classroom Teacher," Research Quarterly, XXXIX (May, 1968), p. 389.

classroom teacher in teaching basic motor skills. Other studies reviewed in this section do not fully support the need for a specialist in physical education at the elementary level. Workman states that:

> In summary, it could be said that the majority of classroom teachers do not consider themselves prepared to teach physical education, prefer not to have the responsibility for teaching in this area and seek the help of specialists in physical education. A great number of elementary teachers continue, however, to be responsible for the physical education of the children in their classes.[51]

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[51] Ibid., pp. 35-36.

CHAPTER III

DESIGN OF THE STUDY

I. SUBJECTS

The subjects for this study were 167 fourth, fifth, and sixth grade children in two elementary schools in Emporia, Kansas. Although no organized check on the socio-economic level of students was conducted, an attempt was made to select schools that were representative of reasonably comparable communities.

II. PHYSICAL EDUCATION PROGRAMS

One school employed a specialist to teach the elementary physical education program to each grade five days a week. The other school employed a specialist to teach the elementary physical education program to each grade one day a week. The other four days of the physical education program were the responsibility of the classroom teacher.

The scheduling of physical education in terms of class meetings per week and total minutes of physical education per week was identical throughout the two schools included in the study. The school which had the specialist five days a week had a daily program of thirty-minute class periods. The school which had the specialist one day a week also had a daily program of thirty-minute class periods. This school also had a thirty-minute class period the other four days when the classroom teacher taught physical education.

In the school which employed the specialist five days a week, the specialist was responsible for overseeing the entire program. In the school which employed the specialist one day a week, the specialist taught the class one day a week and was responsible for coordinating the physical education program with the classroom teacher the other four days. However, the majority of the days the classroom teacher was responsible for the physical education program, the period was more of a recess or free play period with little instruction.

III. SELECTION OF TESTS

Before the relationships and differences between attitudes and motor skill could be established, it was necessary to select an instrument for the measurement of attitudes of children toward physical activity and the measurement of skills of children in physical activity.

The review of literature indicated a diversity of instruments used for measuring attitudes. One of the most commonly reported devices used for the measurement of physical education attitudes has been the attitude scale. While there have been many devices used to measure attitudes toward physical education, most of the attitude scales have been developed to measure students other than those of elementary school age. However, Bowman[52] developed a pupil attitude inventory scale using the Likert system of scale construction as an effective tool for the measurement of attitudes of elementary school children. A slight revision of this attitude inventory scale was used for this study (see Appendix A).

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[52]Bowman, op. cit., pp. 1-166.

The inventory scale consisted of 25 inventory statements. The responses to these statements were evaluated in a manner described by Likert. The subject answered each statement by placing a check (✓) in the space which indicated if they strongly agree, agree, were neutral (don't have feelings either way), disagree, or strongly disagree. If the subject strongly agreed, five points were awarded. A check mark in the space agree was worth four points; neutral, 3 points; disagree, 2 points; and strongly disagree, 1 point. Nine statements were worded negatively. In order to make the scoring of negatively worded statements consistent with the positively worded statements, the scoring scheme was reversed. Thus, favorable attitudes toward physical education were indicated by high scale values and unfavorable attitudes by low scale values, regardless of the positive or negative nature of the statement.

One-hundred and twenty-five points were possible if all statements were rated with a scale value of 5. If all statements were rated with a scale value of one, 25 points were received. Thus, there was a possible range of 100 points. If all statements were ranked neutral (value of 3), the score for that subject would be 75.

The Peacock Achievement Scale[53] was used to measure the proficiency of children in performing certain gross motor activities (see Appendix B). The scale consists of six items: (1) softball throw

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[53]Harold M. Barrow and Rosemary McGee, A Practical Approach to Measurement in Physical Education (Philadelphia: Lea and Febiger, 1964), pp. 173-181.

for distance, (2) soccer punt for distance, (3) forty-yard run, (4) side stepping, (5) standing broad jump, and (6) grip strength. The results of these tests can be used to determine status and progress in the acquisition of certain motor skills.

In the softball throw and the soccer ball punt, four trials were permitted. Only the longest trial was measured and the score was the distance measured to the nearest foot. One trial was permitted in the forty-yard run unless unforeseen circumstances arose. The score was the elapsed time recorded to the nearest 10th of a second. In side stepping, three parallel lines are made four feet apart. The subject takes a standing position astride the middle line. On the signal to start, the subject side steps to the right until his right foot touches or steps over the side line. The subject then side steps to his left until his left foot touches or steps over the side line. The subject must not cross his feet and must touch on or over each side line. The score is the number of times the subject crosses the middle line in fifteen seconds. Four trials were given in the standing broad jump but only the longest trial is measured. The score is the distance measured to the nearest inch. In the grip strength, a hand dynamometer is used to measure hand gripping strength. Each hand was measured once. The score was read from the dynamometer and estimated to the nearest pound.

IV. TESTING PERSONNEL

Trained assistants were used in the administration of the six test items. These assistants consisted of student observers and student

teachers in physical education at the secondary lab school at Kansas State Teachers College; the coach and physical education instructor at the secondary lab school; students enrolled in physical education in the secondary lab school; the teachers of the fourth, fifth, and sixth grades at the two elementary schools; graduate assistants and student teachers at the elementary schools; graduate assistants in physical education at Kansas State Teachers College; and professors of physical education at Kansas State Teachers College.

V. TESTING PROCEDURE

The investigator held a separate meeting with each of the physical education specialists in the two elementary schools involved to acquaint them with the test administration procedures. At this time, test directions were explained and if necessary demonstrated.

The explanation of the tests was prefaced by an explanation of the total research project. The nature of the project was withheld from the subjects in an attempt to reduce bias in testing. However, the subjects were encouraged to do the very best they could.

Although most of the trained assistants had had past experience in the use of the stop-watch, a review of the technique in using this instrument was done with each group of assistants that helped in the testing for that day. These assistants were instructed to come 15 minutes early for the review of the stop-watch and any other questions pertaining to the six test items. It was explained and if necessary demonstrated. Since not many of the assistants knew how to administer

the hand gripping strength with the hand dynamometer, the investigator and one of the professors in physical education administered this test. The techniques of using students effectively in assisting as ball retrievers and scorers were also reviewed.

The pupil activity attitude inventory and the Peacock Achievement Scale were administered during the months of April and May, 1969. The pupil activity attitude inventory was administered indoors. Along with the written test directions, the instructor of the test explained the directions to the subjects. The subjects were asked to read the statements carefully and mark how they felt.

The Peacock Achievement Scale was administered out-of-doors. The tests were administered with a combination of the squad and station-to-station method of organization. The forth-yard run, soccer ball punt, and softball throw tests were administered on grass playgrounds. The standing broad jump and side stepping tests were administered on paved sidewalks. Since hand gripping strength did not need specific surfaces for its administration, it was conducted wherever convenient for the test administrator.

The Peacock Achievement Scale was administered in the afternoons in each elementary school. Also, the same softballs, soccer balls, stop watches, and hand dynamometer was used in each elementary school. The standing broad jump and side stepping tests were administered in the same way in each elementary school. However, in the school which employed the physical education specialist five days a week, the pupil activity attitude inventory test was administered to

the subjects in the gymnasium before the Peacock Achievement Scale. In the school which employed the physical education specialist one day a week, the Peacock Achievement Scale was administered before the pupil activity attitude inventory test.

VI. TEST ADMINISTRATION

Since each class period lasted only 30 minutes for each grade, it was necessary for the investigator to conduct the testing as quickly as possible.

In the elementary school which employed the specialist five days a week, one physical education class period each day for four days for each grade was allowed for the pupil activity attitude inventory test and the Peacock Achievement Scale. During the first testing period, the pupil activity attitude inventory test was administered in the gymnasium. The second testing period was utilized for the softball throw test, hand gripping strength test, and standing broad jump test. The side stepping test and the 40-yard run test were administered the third testing period, and the soccer ball punt test was administered during the last testing period.

To save time in recording scores, the investigator employed a scoring scheme by using three-by-five cards with all six items printed on the card and a blank space to the front of each item in which the score could be recorded. The name of the subject was written on the top of each card. At the beginning of the testing period, the cards were handed out to the subjects. The subjects were then instructed by

the investigator to keep these cards with them during the length of the testing period for that day. As they performed each individual test item, they presented the card to the test instructors at that station and the score was written into the blank space for that appropriate test item. The card was then given back to the subject and he then proceeded on to the next station. At the end of the testing period, all cards were handed back to the investigator.

In the elementary school which employed the physical education specialist one day a week, one physical education class period for each grade was allowed for the Peacock Achievement Scale. During this one testing period, all six items of the Peacock Achievement Scale were administered. In order to save time, the investigator set up six stations. Each grade level was divided into six groups with an assistant assigned to each group. This assistant stayed with his group of subjects until all six testing items were completed. Another assistant was stationed at each of the six testing stations; therefore, at any one time at the six testing stations, two trained assistants administered the one test item.

To save time in recording scores, the investigator employed a scoring scheme of using five-by-eight cards with all six test items printed on the card. The investigator arranged the names on the card so that there were both boys and girls on each card. This system was arranged by names in alphabetical order into six groups for each grade prior to the testing day. As each group and their assistant continued from one testing station to the next, the card with all the names of

the subjects written on it was carried along with the assistant and scores were recorded by the assistant. At the end of the testing period, all cards were handed back to the investigator.

Before statistical comparisons could be compiled from the motor skill test items, raw scores of the six test items had to be converted to T-Scale scores. A composite score derived from adding together the T-Scale scores of the six test items could then be established into workable statistical data.

VII. STATISTICAL PROCEDURES

The major statistical procedures used in this study were the Pearson Product Moment Correlation Coefficient and the *t*-test of the difference between means.

The Pearson Product Moment Correlation was used to determine the relationship between each group's attitude towards physical education and their motor skill in physical education as measured by the Peacock Achievement Scale for Children.

The *t*-test was employed to determine if there were significant differences at the .05 level in either skill or attitude between the children who had physical education one day a week and those who had physical education five days a week.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this study was to compare attitudes and skills of children taught by the physical education specialist five days a week and those taught by the physical education specialist one day a week. The results of the tests were analyzed, and statistical comparisons were made in an effort to determine the significance of the difference between the means.

I. STATISTICAL CORRELATION OF EACH GROUP'S ATTITUDE TOWARD PHYSICAL EDUCATION AND THEIR MOTOR SKILL IN PHYSICAL EDUCATION

In order to determine the relationship between each group's attitude towards physical education and skill in physical education, Pearson Product Momentum Correlations were computed. The composite T-Scale scores of each subject was correlated with his attitude score.

The Groups in the School Which Employed the Physical Education Specialist Five Days a Week

Seventy-seven subjects took the attitude and motor skill tests. Of these 77 subjects, 33 were girls and 44 were boys.

Correlation between attitudes and motor skills of the fourth grade boys and girls. Thirteen fourth grade boys and 13 fourth grade girls took the attitude and motor skill tests. A correlation of -.179

for the boys and .354 for the girls was found between the two attributes. Each of these correlations were found not to be significant at the .05 level.

Correlation between attitudes and motor skills of the fifth grade boys and girls. A correlation of .427 for the 16 boys and .226 for the 10 girls was found between the attitudes and motor skills. These correlations were found not to be significant at the .05 level.

Correlation between attitudes and motor skills of the sixth grade boys and girls. The difference between attitudes and motor skills of the 10 sixth grade girls resulted in a correlation of -.140. This correlation was found not to be significant at the .05 level. However, the correlation of -.634 for the 15 boys was found to be significant at the .05 level.

The Groups in the School Which Employed the Physical Education Specialist One Day a Week

Ninety subjects took the attitude and motor skill tests. Of these 90 subjects, 48 were girls and 42 were boys.

Correlation between attitudes and motor skills of the fourth grade boys and girls. A correlation of .235 for the 16 fourth grade boys and .270 for the 17 fourth grade girls was found between the attitudes and motor skills. These correlations were found not to be significant at the .05 level.

Correlation between attitudes and motor skills of the fifth grade boys and girls. Eleven boys and eighteen girls took the attitude and motor skill tests. A correlation of .094 for the boys and .055 for the girls was found between the two attributes. Each of these correlations were found not to be significant at the .05 level.

Correlation between attitudes and motor skills of the sixth grade boys and girls. The difference between attitudes and motor skills of the fifteen sixth grade boys and the thirteen sixth grade girls resulted in correlations of .412 and -.332 respectively. These correlations were found not to be significant at the .05 level.

The Results of the Twelve Groups in the Two Elementary Schools

Of the twelve groups of boys and girls that took the attitude test and motor skill test in both elementary schools, all showed a definite relationship between attitude and skill except the sixth grade boys in the school which employed the physical education specialist five days a week. The -.634 correlation of that group showed substantially inverse relationship between attitude and motor skill.

II. STATISTICAL COMPARISONS OF SUBJECTS' ATTITUDES IN THE SEPARATE GROUP DIVISIONS OF SEX, GRADE, AND SCHOOL

In this section, each referral to Group A represents those boys or girls taught by the physical education specialist five days a week. Group B represents those boys or girls taught by the physical education specialist one day a week.

The t-test was employed to determine if there were significant differences in attitudes between Group A and Group B.

Statistical Comparison of the Fourth Grade Boy's Attitudes Towards Physical Education

The subjects for the attitude test included thirteen boys from Group A and sixteen boys from Group B. The raw scores of each subject and the total scores of each group are presented (see Appendix C).

The t-ratio was computed for Group A and Group B to determine the difference between the means of the attitude test. This resulted in a t of -3.556 and was found to be significant of the tabled value ± 2.056 at the .05 level.

The hypothesis that there were no significant differences in attitudes towards physical education between children taught by the specialist in physical education five days a week and children taught by the specialist in physical education one day a week was rejected. The alternate hypothesis, that the attitudes of boys taught by the physical education specialist five days a week was less than the attitudes of boys taught by the physical education specialist one day a week, was accepted.

The group taught by the specialist one day a week had significantly better attitudes toward physical education than did the group taught by the specialist five days a week.

A comparison of Group A and Group B has been presented in Table I.

TABLE I

COMPARISON OF FOURTH GRADE BOY'S ATTITUDES
GROUP A AND GROUP B

Group	Number	SD	Mean	t
A	13	7.943	96.230	-3.556*
B	16	8.715	107.687	

* t = ± 2.056 or greater at .05 level with 27 degrees of freedom

* t = ± 2.771 or greater at .01 level with 27 degrees of freedom

Statistical Comparison of the Fourth Grade Girl's Attitudes Towards Physical Education

Thirteen girls from Group A and seventeen girls from Group B are the subjects for the attitude test. The raw scores of each subject and the total scores of each group are presented (see Appendix D).

A t-ratio of 1.833 was computed between the means of the attitude test for Group A and Group B. This t was found not to be significant of the tabled value ± 2.048 at the .05 level.

The hypothesis that there were no significant differences in attitudes towards physical education between Group A and Group B was accepted.

A comparison of Group A and Group B has been presented in Table II.

TABLE II

COMPARISON OF FOURTH GRADE GIRL'S ATTITUDES
GROUP A AND GROUP B

Group	Number	SD	Mean	t
A	13	10.958	97.416	1.833
B	17	6.872	104.058	

t = ± 2.048 or greater at .05 level with 28 degrees of freedom

t = ± 2.763 or greater at .01 level with 28 degrees of freedom

Statistical Comparison of the Fifth Grade Boy's Attitudes Towards Physical Education

There were sixteen boys from Group A and eleven boys from Group B representing the subjects for the attitude test. The raw scores of each subject and the total scores of each group are presented (see Appendix E).

A t-ratio of -.703 was found not to be significant of the tabled value ± 2.060 at the .05 level between the means of the attitude tests of the two groups.

The hypothesis that there were no significant differences in attitudes towards physical education between Group A and Group B was accepted.

A comparison of Group A and Group B has been presented in Table III.

TABLE III

COMPARISON OF FIFTH GRADE BOY'S ATTITUDES
GROUP A AND GROUP B

Group	Number	SD	Mean	t
A	16	8.830	103.125	-.703
B	11	6.034	105.363	

t = ± 2.060 or greater at .05 level with 26 degrees of freedom

t = ± 2.787 or greater at .01 level with 26 degrees of freedom

Statistical Comparison of the Fifth Grade Girl's Attitudes Towards Physical Education

The subjects for the attitude test include ten girls representing Group A and eighteen girls representing Group B. The raw scores of each subject and the total scores of each group are presented (see Appendix F).

The t-ratio was computed for Group A and Group B to determine the difference between the means of the attitude test. This resulted in a t of -.781. It was found not to be significant of the tabled value ± 2.056 at the .05 level.

The hypothesis that states that there were no significant differences in attitudes towards physical education between Group A and Group B was accepted.

A comparison of Group A and Group B has been presented in Table IV.

TABLE IV

COMPARISON OF FIFTH GRADE GIRL'S ATTITUDES
GROUP A AND GROUP B

Group	Number	SD	Mean	t
A	10	9.676	103.600	-.781
B	18	9.830	106.722	

$t = \pm 2.056$ or greater at .05 level with 26 degrees of freedom

$t = \pm 2.779$ or greater at .01 level with 26 degrees of freedom

Statistical Comparison of the Sixth Grade Boy's Attitudes Towards Physical Education

The subjects for the attitude test included fifteen boys from Group A and fifteen boys from Group B. The raw scores of each subject and the total scores of each group are presented (see Appendix G).

A t-ratio of -.788 was computed for Group A and Group B to determine the difference between the means of the attitude test. This t-ratio was found not to be significant of the tabled value ± 2.045 at the .05 level.

The hypothesis that there were no significant differences in attitudes towards physical education between children of Group A and children of Group B was accepted.

A comparison of Group A and Group B has been presented in Table V.

TABLE V

COMPARISON OF SIXTH GRADE BOY'S ATTITUDES
GROUP A AND GROUP B

Group	Number	SD	Mean	t
A	15	8.639	105.133	-.788
B	15	5.284	107.266	

$t = \pm 2.045$ or greater at .05 level with 29 degrees of freedom

$t = \pm 2.756$ or greater at .01 level with 29 degrees of freedom

Statistical Comparison of the Sixth Grade Girl's Attitudes Towards Physical Education

There were ten girls from Group A and thirteen girls from Group B representing the subjects for the attitude test. The raw scores of each subject and the total scores of each group are presented (see Appendix H).

The t-ratio was computed for Group A and Group B to determine the difference between the means of the attitude test. This resulted in a t of 3.261. This t was found to be significant of the tabled value $\pm$ 2.080 at the .05 level.

The hypothesis that there were no significant differences in attitudes towards physical education between Group A and Group B was rejected. The alternate hypothesis, that the attitudes of children taught by the physical education specialist five days a week were better than the attitudes of children taught by the physical education specialist one day a week, was accepted.

Group A had significantly better attitudes towards physical education than did Group B. A comparison of the attitudes of Group A and Group B has been presented in Table VI.

TABLE VI

COMPARISON OF SIXTH GRADE GIRL'S ATTITUDES
GROUP A AND GROUP B

Group	Number	SD	Mean	t
A	10	7.045	107.600	3.261*
B	13	4.199	99.538	

* t = ± 2.080 or greater at .05 level with 21 degrees of freedom

* t = ± 2.831 or greater at .01 level with 21 degrees of freedom

III. STATISTICAL COMPARISONS OF SUBJECTS' SKILLS IN THE SEPARATE GROUP DIVISIONS OF SEX, GRADE, AND SCHOOL

As in the preceding section, Group A refers to the boys or girls taught by the physical education specialist five days a week; and Group B refers to the boys or girls taught by the physical education specialist one day a week.

The t-test was employed to determine if there were significant differences in skills between Group A and Group B.

Statistical Comparison of the Fourth Grade Boy's Skills in Physical Education

The subjects for the skill test included thirteen boys from Group A and sixteen boys from Group B. The T-Scale scores of each subject and the total scores of each group are presented (see Appendix I).

The t-ratio was computed for Group A and Group B to determine the difference between the means of the skill test. This resulted in a t of 1.472 and was found not to be significant of the tabled value ± 2.056 at the .05 level.

The hypothesis that states there were no significant differences in skills in physical education between children taught by the specialist in physical education five days a week and children taught by the specialist in physical education one day a week was accepted.

A comparison of Group A and Group B has been presented in Table VII.

TABLE VII

COMPARISON OF FOURTH GRADE BOY's SKILLS
GROUP A AND GROUP B

Group	Number	SD	Mean	t
A	13	57.480	380.969	1.472
B	16	41.927	352.768	

t = ± 2.056 or greater at .05 level with 27 degrees of freedom

t = ± 2.771 or greater at .01 level with 27 degrees of freedom

Statistical Comparison of the Fourth Grade Girl's Skills in Physical Education

Thirteen girls from Group A and seventeen girls from Group B are the subjects for the skill test. The T-Scale scores of each subject and the total scores of each group are presented (see Appendix J).

A t-ratio of 1.347 was computed between the means of the skill test for group A and Group B. This t was found not to be significant of the tabled value ± 2.048 at the .05 level.

The hypothesis that there were no significant differences in skills in physical education between Group A and Group B was accepted.

A comparison of Group A and Group B has been presented in Table VIII.

TABLE VIII

COMPARISON OF FOURTH GRADE GIRL'S SKILLS
GROUP A AND GROUP B

Group	Number	SD	Mean	t
A	13	37.493	379.507	1.347
B	17	46.526	357.494	

t = ± 2.048 or greater at .05 level with 28 degrees of freedom

t = ± 2.763 or greater at .01 level with 28 degrees of freedom

Statistical Comparison of the Fifth Grade Boy's Skills in Physical Education

There were sixteen boys from Group A and eleven boys from Group B representing the subjects for the attitude test. The T-Scale scores

of each subject and the total scores of each group are presented (see Appendix K).

A t-ratio of -.143 was found not to be significant of the tabled value ± 2.060 at the .05 level between the means of the skill test of the two groups.

The hypothesis that there were no significant differences in skills in physical education between Group A and Group B was accepted.

A comparison of Group A and Group B has been presented in Table IX.

TABLE IX

COMPARISON OF FIFTH GRADE BOY'S SKILLS
GROUP A AND GROUP B

Group	Number	SD	Mean	t
A	16	56.112	365.062	-.143
B	11	35.113	367.909	

t = ± 2.060 or greater at .05 level with 26 degrees of freedom

t = ± 2.787 or greater at .01 level with 26 degrees of freedom

Statistical Comparison of the Fifth Grade Girl's Skills in Physical Education

The subjects for the skill test include ten girls representing Group A and eighteen girls representing Group B. The T-Scale scores of each subject and the total scores of each group are presented (see Appendix L).

The t-ratio was computed for Group A and Group B to determine the difference between the means of the skill test. This resulted in a t of -.282. It was found not to be significant of the tabled value ± 2.056 at the .05 level.

The hypothesis that states that there were no significant differences in skills in physical education between Group A and Group B was accepted.

A comparison of Group A and Group B has been presented in Table X.

TABLE X

COMPARISON OF FIFTH GRADE GIRL'S SKILLS
GROUP A AND GROUP B

Group	Number	SD	Mean	t
A	10	60.385	363.560	-.282
B	18	36.500	368.922	

t = ± 2.056 or greater at .05 level with 26 degrees of freedom

t = ± 2.779 or greater at .01 level with 26 degrees of freedom

Statistical Comparison of the Sixth Grade Boy's Skills in Physical Education

The subjects for the skill test included fifteen boys from Group A and fifteen boys from Group B. The T-Scale scores of each subject and the total scores of each group are presented (see Appendix M).

A t-ratio of .683 was computed for Group A and Group B to determine the difference between the means of the skill test. This

t was found not to be significant of the tabled value ± 2.045 at the .05 level.

The hypothesis that there were no significant differences in skills in physical education between Group A and Group B was accepted.

A comparison of Group A and Group B has been presented in Table XI.

TABLE XI

COMPARISON OF SIXTH GRADE BOY'S SKILLS
GROUP A AND GROUP B

Group	Number	SD	Mean	t
A	15	53.777	368.160	.683
B	15	39.703	355.966	

t = ± 2.045 or greater at .05 level with 29 degrees of freedom

t = ± 2.756 or greater at .01 level with 29 degrees of freedom

Statistical Comparison of the Sixth Grade Girl's Skills in Physical Education

There were ten girls from Group A and thirteen girls from Group B representing the subjects for the skill test. The T-Scale scores of each subject and the total scores of each group are presented (see Appendix N).

The t-ratio was computed for Group A and Group B to determine the difference between the means of the skill test. This resulted in a t of .793. This t was found not to be significant of the tabled value ± 2.080 at the .05 level.

The hypothesis that there were no significant differences in skills in physical education between Group A and Group B was accepted.

A comparison of the data of Group A and Group B has been presented in Table XII.

TABLE XII

COMPARISON OF SIXTH GRADE GIRLS'S SKILLS
GROUP A AND GROUP B

Group	Number	SD	Mean	t
A	10	60.848	377.150	.793
B	13	33.879	359.292	

$t = \pm 2.080$ or greater at .05 level with 21 degrees of freedom

$t = \pm 2.831$ or greater at .01 level with 21 degrees of freedom

CHAPTER V

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to compare attitudes and skills of children taught by the physical education specialist five days a week and those taught by the physical education specialist one day a week.

More specifically, the investigator attempted to answer the following sub-problems: (1) Is there a difference in the attitudes of girls taught by the specialist five days a week and of girls taught by the specialist one day a week; (2) Is there a difference in skills of girls taught by the specialist five days a week and of girls taught by the specialist one day a week; (3) Is there a difference in attitudes of boys taught by the specialist five days a week and of boys taught by the specialist one day a week; (4) Is there a difference in skills of boys taught by the specialist five days a week and of boys taught by the specialist one day a week; (5) To determine if those children who have high attitudes in physical education will also have high skills in physical education; and (6) To determine if those children who have low attitudes in physical education will also have low skills in physical education.

In an effort to answer the above problems, the following tests for attitude and skill were conducted: (1) Pupil Activity Attitude Inventory, and (2) Peacock Achievement Scales for Children.

I. FINDINGS

The findings of the study were as follows:

1. Eleven of the twelve groups of girls and boys of the two elementary schools showed a definite relationship between attitude and motor skill. A fairly high negative relationship existed between attitude and motor skill of the sixth grade boys at the school which employed the physical education specialist five days a week.

2. Fourth grade boys taught by the physical education specialist one day a week had significantly better attitudes towards physical education than did the boys taught by the physical education specialist five days a week. The relationship between skills of the two groups of fourth grade boys did not produce significant results.

3. The relationship between attitudes of the two groups of fourth grade girls and skills of the two groups of fourth grade girls did not produce significant results.

4. There were no significant differences between attitudes of the two groups of fifth grade boys and skills of the two groups of fifth grade boys.

5. The results between attitudes of the two groups of fifth grade girls and skills of the two groups of fifth grade girls were found not to be significant.

6. There existed no significant differences between attitudes of the two groups of sixth grade boys and skills of the two groups of sixth grade boys.

7. There were significantly better attitudes towards physical education by the sixth grade girls taught by the physical education specialist five days a week than those sixth grade girls taught by the physical education specialist one day a week. The results between skills of the two groups of sixth grade girls was found not to be significant.

II. CONCLUSIONS

The following conclusions resulted from this study:

1. Fourth grade boys taught by the physical education specialist one day a week have better attitudes toward physical education than do fourth grade boys taught by the physical education specialist five days a week.

2. Sixth grade girls taught by the physical education specialist five days a week have better attitudes toward physical education than do sixth grade girls taught by the physical education specialist one day a week.

3. Fourth grade girls taught by the physical education specialist one day a week have better attitudes towards physical education than do the fourth grade girls taught by the physical education specialist five days a week.

4. Fifth grade boys taught by the physical education specialist one day a week have better attitudes toward physical education than do the fifth grade boys taught by the physical education specialist five days a week.

5. Fifth grade girls taught by the physical education specialist one day a week have better attitudes toward physical education than do the fifth grade girls taught by the physical education specialist five days a week.

6. Sixth grade boys taught by the physical education specialist one day a week have better attitudes toward physical education than do the sixth grade boys taught by the physical education specialist five days a week.

7. Fourth grade boys taught by the physical education specialist five days a week have better motor skills in physical education than do the fourth grade boys taught by the physical education specialist one day a week.

8. Fourth grade girls taught by the physical education specialist five days a week have better motor skills in physical education than do the fourth grade boys taught by the physical education specialist one day a week.

9. Sixth grade boys taught by the physical education specialist five days a week have better motor skills in physical education than do the sixth grade boys taught by the physical education specialist one day a week.

10. Sixth grade girls taught by the physical education specialist five days a week have better motor skills in physical education than do the sixth grade girls taught by the physical education specialist one day a week.

11. Fifth grade boys taught by the physical education specialist one day a week have better motor skills in physical education than do fifth grade boys taught by the physical education specialist five days a week.

12. Fifth grade girls taught by the physical education specialist one day a week have better skills in physical education than do fifth grade girls taught by the physical education specialist five days a week.

III. RECOMMENDATIONS

Through the course of this study, several areas have emerged which could not be covered in this investigation. The recommendations for further study are as follows:

1. A study designed to evaluate the effects of teaching that includes more physical education specialists, more schools, and a random sampling of students from those schools, so that a more representative sample of students and specialists would be available.

2. For a more thorough comparison of the two types of teaching arrangements, measurements of skill beyond the six represented in this study might be included. The areas of gymnastics, tumbling, and rhythms show particular need to be included in this type of investigation.

3. A study which gives consideration to the sex and amount of experience of the specialists in each of the two groups. It is recommended that a comparison between subjects of opposite sex from different schools be included.

4. The administration of an attitude pre-test and post-test to both groups to determine whether the sex and/or the experience of the specialist involved influences a change of subjects' attitudes within the testing period.

5. The administration of a skill pre-test and post-test to both groups to determine whether the sex and/or the experience of the specialist involved influences the development of skills throughout the testing period.

6. The development of an attitude test for a particular group, using subjects comparable to that group.

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APPENDIXES

APPENDIX A

PUPIL ACTIVITY ATTITUDE INVENTORY

We would like to know how you feel about games, sports, dancing and other physical activities. These statements are some of the things other boys and girls have said. We would like to know if you agree or disagree with the statement. You may agree very strongly, agree, be neutral (don't have any feeling either way), disagree, or very strongly disagree. There is a place to mark how you feel. There are no right answers, just your opinions.

Directions

1. Read the statement.
2. Mark a check (✓) in the column which shows how you feel.
3. Mark how you feel and do not change your answer.
4. Answer every statement.
5. Mark only one answer to each statement.

Example

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Most games are stupid.		✓			

Mark how you feel in only one of the five spaces like this:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Games played in the fresh air are good for me.					
It is fun to try to beat my own score in games like jumping, archery, or bowling.					
Playing games or sports keeps me out of trouble.					
I do not want to get better in activities.					
Kicking a ball is dull.					
Tumbling is good exercise.					
Games which make me hot and sweaty are not fun.					
I will probably get hurt if I play an active game.					
Practicing skills of games is important to me.					
Active games make me too tired and uncomfortable.					
Activities like dancing do not require skill.					
Playing active games makes me strong and sturdy.					
Activities with very little moving in them are the most fun.					
Playing gives me a chance to use my imagination.					
It is important to know the rules of a game.					
It makes me happy to succeed in a game.					
I am interested in improving my skill in most games.					
Games teach people to be good sports.					
I like to have a chance to do daring things.					
I do not care how far I can throw a ball.					
Trying to learn a new game or sport is fun.					
I like to see how accurately I can throw a ball.					
Games and sports gives me something I like to do in my spare time.					
I only like to play a game if I can win.					
Swimming gives me a good clean feeling.					

APPENDIX B

PEACOCK ACHIEVEMENT SCALES IN PHYSICAL EDUCATION ACTIVITIES FOR BOYS AND GIRLS

Purpose

Primarily to measure the proficiency of children in performing certain gross motor activities.

Evaluation

Face validity was accepted for each item.

Level and Sex

Boys and girls ages 7 through 15.

Time Allotment and Number of Subjects

The entire test can be administered to a class of 35 to 40 in 2 class periods if adequate student assistants are trained and if the number of stations is sufficient.

Floor Plan and Space Requirements

The softball throw, soccer and volleyball punt and forty-yard dash will need to be administered out-of-doors. The standing broad jump may be administered either indoors or out-of-doors and the side step and grip strength can be given indoors.

Class Organization

This test can be administered first with a combination of the squad and station-to-station method of organizing. Scoring can be done by squad leaders or trained assistants.

General Procedure

1. Facilities, equipment, and score cards should be made ready in advance of the testing period.
2. Instructions and demonstrations should be given to the students for each test item immediately preceding the administration of that item.
3. The student's age in years and months should be recorded on the score card.
4. In the throw for distance a tennis ball is substituted for the softball when the 7- to 9-year-old groups are being tested.
5. In the soccer punt a volleyball is substituted for the soccer ball in the 7- to 9-year-old groups.

Uses

The results of these tests can be used to determine status and progress in the acquisition of certain motor skills. More specifically, the status data can be used to classify students into groups for instructional purposes and to diagnose strength and weakness in the elements common to many team games.

Test Description

ITEM NUMBER I--SOFTBALL THROW FOR DISTANCE
(Tennis ball for ages 7 to 9)

Purpose: To measure the ability of the student to throw a ball for distance.

Facilities and Equipment: A space out-of-doors of at least 200 by 50 feet with a restraining line at one end. At least five regulation 12-inch inseam softballs (tennis balls for 7 to 9 age group). A 100-foot measuring tape.

Procedure: The student stands any distance he chooses behind the restraining line. In making his throw he may run up to the line but not cross it. He may throw with any method he chooses, such as overhand or side arm. Throwers warm-up in pairs and then each is permitted four throws but only the longest is measured and the first is a practice throw.

Instructions: You must warm up properly, after which you take a position behind the restraining line. In making your throw you may run up to the line but it is a foul to step over it. Throw the ball in any manner you choose.

Scoring: The score is the distance of the best throw measured to the nearest foot.

Testing Personnel: Two trained assistants are needed, one to supervise the restraining area and one to mark, measure, and record the throws.

ITEM NUMBER II--SOCCER PUNT FOR DISTANCE
(Volleyball for age 7 to 9)

Purpose: To measure the ability of the student to kick a ball for distance.

Facilities and Equipment: An area out-of-doors similar in size to the softball throw with a restraining line at one end. Five regulation soccer balls in good condition (volleyballs for age 7 to 9). A 100-foot measuring tape.

Procedure: The student holds the soccer ball in his hands while he is standing behind the restraining lines. He may take several steps

and then punts the ball for distance. It is a foul to step over the restraining line. The test assistant who is marking throws should let the ball hit the ground. One practice punt is permitted and then three trials are taken and the longest one is measured.

Instructions: Hold the ball in both hands. Take as many steps as you wish. Drop the ball and kick it before it hits the ground. Look at the ball as you kick it and try to kick it as far as you can straight down the field.

Scoring: The score is the distance measured to the nearest foot of the longest kick from the restraining line to the spot where the ball first touches the ground.

Testing Personnel: At least two trained assistants are needed, one to supervise the kicking area and one to mark, measure, and record kicks.

ITEM NUMBER III--FORTY-YARD RUN

Purpose: To measure the leg speed of the student.

Facilities and Equipment: A smooth surface area, preferably a track, of at least 60 yards in length with a starting and finishing line. One stop watch is necessary but two or more will speed up the administration time considerably.

Procedure: This event is administered like any sprint except the standing start is recommended. The starter raises his arm and gives the command, "Ready," "Go!" and at the same time brings his arm down sharply. At the command the student starts his run and the timer, stationed at the finish, starts his watch. The timer stops his watch as the runner crosses the finish line. Only one trial is permitted unless unforeseen circumstances arise.

Instructions: Take a standing position at the starting line unless you would prefer the crouched position. On the signal, "Go!" run as fast as you can across the finish line. Don't slow down until you are across the line.

Scoring: The score is the elapsed time recorded to the nearest 10th of a second.

Testing Personnel: Two trained assistants are needed (and more if there are more stop watches), one starter and an operator for each stop watch. The timer can also record scores.

ITEM NUMBER IV--STANDING BROAD JUMP

Purpose: To measure leg power.

Facilities and Equipment: One 5 by 12-foot tumbling mat marked with a take-off line and parallel lines two inches apart indicating distance from the take-off line. If the mat is not available, the floor can be used with a take-off mark and a tape measure.

Directions: The subject assumes the starting position behind the take-off mark with his feet parallel. He takes a preliminary movement by bending his knees and swinging his arms and jumps outward as far as possible. Three trials are permitted and all in succession.

Instructions: You should crouch before you jump and swing your arms downward. As you jump outward, the arms should be swung forward and upward. Take off from the mark with both feet simultaneously and try not to fall backwards after landing.

Scoring: The final score is the distance of the best jump measured to the nearest inch.

Testing Personnel: One trained assistant to supervise the testing station and measure and record the score.

ITEM NUMBER V--SIDE STEPPING

Purpose: To measure the ability of the student to change directions.

Facilities and Equipment: This is an indoor item and a small area on the floor is needed. On the floor area three parallel lines are made four feet apart. The item may be administered out-of-doors either on concrete or asphalt. A stop watch is needed.

Procedure: The student takes his standing position astride the middle line. On the signal to start, he side steps to the right until his right foot touches or steps over the side line. He then side steps to his left until his left foot touches or steps across the left side line. He then repeats this right to left and left to right movement as rapidly as possible for 15 seconds. The student must face to the side throughout the test with his body and shoulder perpendicular to the parallel lines and he must not cross his feet.

Instructions: You stand astride the center line facing sideways to the side line. On the signal, "Go," you side step right until you have touched or crossed that side line. Repeat the same movement to your left until you have touched or crossed that line. Continue in this manner as rapidly as possible until the stop signal. You must face sideways at all times throughout the test. It is a foul to cross your feet, not to face sideways, or not to touch on or over a line.

Scoring: The score is the number of times the student crosses the middle line in 15 seconds.

Testing Personnel: One trained assistant at each station to time and record score.

ITEM NUMBER VI--GRIP STRENGTH

Purpose: To measure the hand gripping strength of the student.

Facilities and Equipment: A hand dynamometer and a towel.

Procedure: The student grasps the dynamometer in his hand and may assume any position he desires with his arms and body. However, the hand holding the instrument may not rest against the body or any object. The concave portion of the dynamometer is held against the first and second joints of the fingers and the convex portion against the base of the hand. The face of the indicator is always turned away from the palm so it can be easily read and also so the indicator may have freedom of action. The strength is taken for each hand and the scores recorded separately. The test assistant must reset the indicator after each trial by gently pushing the hand back to zero.

Instructions: You grasp the dynamometer in your hand with the indicator hand outward away from the palm. The edge which is curved upwards is held in the finger against the portion between the first and second joint and the more rounded edge against the heel of the hand. You grip with all your strength. You must not touch your gripping hand against your body or any object.

Scoring: The score is read from the indicator and estimated to the nearest pound.

Testing Personnel: One test administrator can administer the test and record scores.

APPENDIX C

RAW SCORES OF FOURTH GRADE
BOY'S ATTITUDE TEST

Specialist 5 days a week		Specialist 1 day a week	
Case	Score	Case	Score
1	100	1	99
2	91	2	94
3	103	3	105
4	101	4	106
5	90	5	113
6	105	6	109
7	89	7	111
8	99	8	106
9	75	9	96
10	101	10	122
11	102	11	113
12	94	12	122
13	101	13	102
		14	107
		15	121
		16	97
Total	1251	Total	1723
Mean	96.230	Mean	107.687
Difference in the means of each group:			11.457

APPENDIX D

RAW SCORES OF FOURTH GRADE
GIRL'S ATTITUDE TEST

Specialist 5 days a week		Specialist 1 day a week	
Case	Score	Case	Score
1	74	1	104
2	107	2	124
3	98	3	106
4	115	4	105
5	97	5	106
6	110	6	103
7	100	7	113
8	102	8	110
9	85	9	97
10	95	10	100
11	102	11	97
12	82	12	100
13	100	13	95
		14	104
		15	105
		16	104
		17	96
Total	1267	Total	1769
Mean	97.461	Mean	104.058
Difference in the means of each group:			6.597

APPENDIX E

RAW SCORES OF FIFTH GRADE
BOY'S ATTITUDE TEST

Specialist 5 days a week		Specialist 1 day a week	
Case	Score	Case	Score
1	107	1	99
2	99	2	108
3	94	3	112
4	102	4	113
5	94	5	100
6	86	6	117
7	107	7	104
8	104	8	101
9	103	9	102
10	120	10	105
11	117	11	98
12	116		
13	105		
14	98		
15	95		
16	103		
Total	1650	Total	1159
Mean	103.125	Mean	105.363
Difference in the means of each group:			2.238

APPENDIX F

RAW SCORES OF FIFTH GRADE
GIRL'S ATTITUDE TEST

Specialist 5 days a week		Specialist 1 day a week	
Case	Score	Case	Score
1	91	1	104
2	98	2	98
3	121	3	116
4	110	4	116
5	111	5	98
6	104	6	106
7	102	7	112
8	89	8	116
9	113	9	124
10	97	10	96
		11	108
		12	114
		13	110
		14	117
		15	88
		16	106
		17	88
		18	104
Total	1036	Total	1921
Mean	103.600	Mean	106.722
Difference in the means of the two groups:			3.122

APPENDIX G

RAW SCORES OF SIXTH GRADE
BOY'S ATTITUDE TEST

Specialist 5 days a week		Specialist 1 day a week	
Case	Score	Case	Score
1	111	1	106
2	115	2	110
3	96	3	107
4	104	4	108
5	108	5	105
6	105	6	109
7	114	7	110
8	116	8	107
9	84	9	105
10	99	10	116
11	114	11	99
12	97	12	115
13	107	13	110
14	109	14	94
15	98	15	108
Total	1577	Total	1609
Mean	105.133	Mean	107.266
Difference in the means of each group:			2.133

APPENDIX H

RAW SCORES OF SIXTH GRADE
GIRL'S ATTITUDE TEST

Specialist 5 days a week		Specialist 1 day a week	
Case	Score	Case	Score
1	104	1	101
2	107	2	99
3	116	3	96
4	115	4	104
5	116	5	100
6	107	6	102
7	105	7	100
8	98	8	98
9	113	9	95
10	95	10	98
		11	106
		12	105
		13	90
Total	1076	Total	1294
Mean	107.600	Mean	99.538
Difference in the means of each group:			8.062

APPENDIX I

T-SCALE SCORES OF FOURTH GRADE
BOY'S SKILL TEST

Specialist 5 days a week		Specialist 1 day a week	
Case	Score	Case	Score
1	321.4	1	355.6
2	452.9	2	296.0
3	462.5	3	380.0
4	322.0	4	388.7
5	323.8	5	336.5
6	353.6	6	240.4
7	462.5	7	378.1
8	424.6	8	297.6
9	382.4	9	357.9
10	353.7	10	374.9
11	437.0	11	383.7
12	360.2	12	410.6
13	296.0	13	345.1
		14	362.0
		15	348.3
		16	388.9
Total	4952.6	Total	5745.5
Mean	380.969	Mean	352.768
Difference in the means of each group:			28.201

APPENDIX J

T-SCALE SCORES OF FOURTH GRADE
GIRL'S SKILL TEST

Specialist 5 days a week		Specialist 1 day a week	
Case	Score	Case	Score
1	368.4	1	371.7
2	415.1	2	424.1
3	420.0	3	409.0
4	434.6	4	297.4
5	374.8	5	435.5
6	369.9	6	384.4
7	365.0	7	325.4
8	335.3	8	319.3
9	299.9	9	344.3
10	376.1	10	351.7
11	436.9	11	368.9
12	374.2	12	282.4
13	363.4	13	390.5
		14	373.8
		15	305.7
		16	403.0
		17	290.3
Total	4933.6	Total	6178.2
Mean	379.507	Mean	357.494
Difference in the means of each group:			22.013

APPENDIX K

T-SCALE SCORES OF FIFTH GRADE
BOY'S SKILL TEST

Specialist 5 days a week		Specialist 1 day a week	
Case	Score	Case	Score
1	416.6	1	350.3
2	400.0	2	358.3
3	274.5	3	314.9
4	475.7	4	359.1
5	358.4	5	375.3
6	279.7	6	426.1
7	300.0	7	406.9
8	416.3	8	303.1
9	351.6	9	389.5
10	411.9	10	370.3
11	438.0	11	393.2
12	326.9		
13	359.3		
14	318.4		
15	370.5		
16	343.2		
Total	5841.0	Total	4046.9
Mean	365.062	Mean	367.909
Difference in the means of each group:			2.847

APPENDIX L

T-SCALE SCORES OF FIFTH GRADE
GIRL'S SKILL TEST

Specialist 5 days a week		Specialist 1 day a week	
Case	Score	Case	Score
1	305.5	1	340.8
2	230.6	2	357.2
3	345.1	3	294.1
4	366.6	4	375.7
5	311.8	5	359.2
6	331.0	6	386.1
7	346.8	7	436.7
8	373.8	8	374.8
9	532.0	9	358.0
10	372.4	10	357.7
		11	408.9
		12	299.6
		13	396.9
		14	433.0
		15	381.3
		16	353.2
		17	349.6
		18	377.8
Total	3605.6	Total	6640.6
Mean	363.560	Mean	368.922
Difference in the means of each group:			5.362

APPENDIX M

T-SCALE SCORES OF SIXTH GRADE
BOY'S SKILL TEST

Specialist 5 days a week		Specialist 1 day a week	
Case	Score	Case	Score
1	313.9	1	408.5
2	321.4	2	341.6
3	407.4	3	350.6
4	433.9	4	342.7
5	278.9	5	290.7
6	282.8	6	381.4
7	406.5	7	372.0
8	353.5	8	336.7
9	417.7	9	401.5
10	437.1	10	376.9
11	298.1	11	295.6
12	412.8	12	374.1
13	375.4	13	430.7
14	381.5	14	321.8
15	401.5	15	314.7
Total	5622.4	Total	5339.5
Mean	368.160	Mean	355.966
Difference in the means of each group:			12.194

APPENDIX N

T-SCALE SCORES OF SIXTH GRADE
GIRL'S SKILL TEST

Specialist 5 days a week		Specialist 1 day a week	
Case	Score	Case	Score
1	481.6	1	277.7
2	322.9	2	361.2
3	331.7	3	361.7
4	354.5	4	369.9
5	340.4	5	362.5
6	332.4	6	410.4
7	473.0	7	334.7
8	317.9	8	393.9
9	444.4	9	380.7
10	372.7	10	393.8
		11	346.9
		12	315.6
		13	361.8
Total	3771.5	Total	4670.8
Mean	377.150	Mean	359.292
Difference in the means of each group:			17.858