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A Relationship of Basketball Skill Ability as Compared to Physical Education Grade Point Average and Overall Grade Point Averages of Sixth and Seventh Grade Boys at Woodside Elementary School

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A RELATIONSHIP OF BASKETBALL SKILL ABILITY AS COMPARED TO PHYSICAL EDUCATION GRADE POINT AVERAGE AND OVERALL GRADE POINT AVERAGES OF SIXTH AND SEVENTH GRADE BOYS AT WOODSIDE ELEMENTARY SCHOOL

by

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This thesis submitted by Dale W. Tylka in partial fulfillment of the requirements for the Degree of Master of Science from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

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Title A RELATIONSHIP OF BASKETBALL SKILL ABILITY AS COMPARED TO PHYSICAL EDUCATION GRADE POINT AVERAGE AND OVERALL GRADE POINT AVERAGES OF SIXTH AND SEVENTH GRADE BOYS AT WOODSIDE ELEMENTARY SCHOOL

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Date July 26, 1971

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ABSTRACT

The first phase of the problem was to determine if there were a relationship between basketball skill ability and physical education grade point average. The second phase was to determine if there were a relationship between the same basketball skill ability and academic grade point average.

The AAHPER Basketball Skills Test was administered to 100 sixth and seventh grade boys at Woodside Elementary School. After their basketball skill scores were standardized, these scores were correlated with their physical education grade point average and their academic grade point average using the Pearson Product-Moment Formula. A correlation coefficient of 0.62 was found between basketball skill and physical education grade point average. This proved significant at the 0.01 level. A correlation coefficient of 0.27 was found between basketball skill and academic grade point average. This also proved significant at the 0.01 level. In both cases, the null hypothesis of there not being any relationship between skill and grade point average was rejected.

It was concluded on the basis of the results of this

study that there is a relationship between basketball skill ability and physical education grade point average. It was also concluded there was a relationship between basketball skill ability and academic grade point average for the subjects tested at Woodside School.

CHAPTER I

THE PROBLEM AND IT'S SCOPE

Introduction

In the year 1650 Comenius (1) made the statement: "Intellectual progress is conditioned at every step by bodily vigor. To attain the best results, physical exercise must accompany and condition mental training." From this statement, it is assumed that a physically adept body is essential in the development of the mind.

This statement of "Oneness of Mind and Body" (2) has remained with physical educators down through the years. These people believed that participation in their program was essential for maximum mental achievement.

Opponents to this traditional train of thought believed "brains and brawn" do not mix. They believed the gifted student academically was not necessarily gifted athletically.

Thus, there has been much controversy among researchers as to the actual relationship, if any, between physical ability and academic ability. The purpose of this study was to determine whether the writer found a relationship between physical ability and academic achievement.

Statement of the Problem

The first phase of the problem was to compare physical education grade point averages with the American Association For Health Physical Education and Recreation Basketball Skills Test scores. The second phase of the problem was to compare academic achievement using scholastic grade point averages with the same basketball skills test scores.

Limitations

The study concerned itself with one hundred sixth and seventh grade boys attending Woodside School of the Wisconsin Rapids public school system, Wisconsin Rapids, Wisconsin. These one hundred students attended Woodside school between the periods of January 1971 and June 1971. This sample was selected from approximately one hundred and twenty who were tested for basketball skill ability during this period. All one hundred and twenty were not used because some individual records were incomplete due to absences on testing dates. The ages of the sample ranged from eleven to fourteen. All subjects in the sample were of the Caucasian race. The study was limited by the fact that subjective grades given by teachers were used to compute the academic grade point average.

Review of Literature

Various studies have attempted to determine the relationship between academic success and athletic ability. Some investigators have concluded that the two aspects were very closely related while other findings revealed a negative relationship. In 1927, F. W. Cozens (3) wrote: "The better developed a boy or girl is for his or her age, the more able he or she is in school work."

The general level of physical ability of children who rated highly on intelligence tests was distinctly superior to that of children who rated low on intelligence. There seemed to be a direct relationship between ability in physical tests and promotion or scholastic results.

Rogers and Palmer (4) conducted a study at the Nathaniel Hawthorne Junior High School in Yonkers, New York, which indicated that the improvement of physical ability has a positive effect upon academic work. In this study twenty-five boys and girls with the lowest physical fitness scores, as measured in October of 1954, were selected from the total school population and were placed in a special class which met daily to study the cause of the low physical fitness scores and to try to improve these scores. Along with the physical fitness record, a record was kept of each pupil which included his academic work, height, weight, and other pertinent information. The physical fitness test was readministered in February and again

in April of 1955. The April reports showed a definite improvement in academic marks of those pupils who had increases in their physical fitness scores.

Various other researchers have found physical aspects directly related to academic achievement. In a study of the relationship of physical fitness to success in school and personality, Robert Weber (5) concluded that there was a significant relationship between physical fitness scores and grade point average. In an investigation involving high school boys, Ray (6) reported, "the athlete is not only superior in mental ability as measured by I.Q. but more superior as measured by number of academic failures."

Marcia Hart (7) studied the relationship between physical fitness indices and academic indices of sophomore women at Springfield College. Findings indicated that students who have high physical fitness indices have high academic indices.

Gailand McCollum (8) found essentially the same results in his research. Comparisons were made between the physically fit and the physically unfit with regards to intelligence, academic achievement, and attendance in school. The group ranking high in physical fitness demonstrated a significantly greater degree of academic achievement.

The American Association for Health Physical Education and Recreation Fitness Conference Committee (9) has made one of the first statements concerning the relationship of body and mind. The committee stated:

> The ability to function depends upon the physical, mental, emotional, social, and spiritual components of fitness, all of which are related to each other and are mutually interdependent.

Appleton (10) completed a study in 1949 at the United States Military Academy which also related physical ability to academic ability.

> The findings revealed that there were twice as many academic failures in the lowest seven per cent of the physical ability range as in the top ninety-three per cent. This relationship was greatest below the first percentile of physical ability with ninety one per cent of failures, and it gradually decreased by accumulative percentage groups to the twelfth percentile of physical ability below which there were thirty four per cent of failures. The number of unsuccessful cadets decreased with each additional percentile from the first to the twelfth percentile. Therefore the total number of failures in the lowest twelve per cent of physical-ability was less than the number of failures in the lowest one per cent of physical ability. Above the twelfth percentile the relationship became less apparent and approached insignificance.

The research that was most related to the present study was conducted by Eidsmoe (11). Eidsmoe was interested in disproving the notion that participation in athletics was either an invitation to low quality academic performance or that it attracted individuals who did not succeed academically. Eidsmoe made a survey of the academic standing of the twelve members of each basketball team in the Iowa 1960-61 Boys' Sub-State and State Tournaments.

School administrators were asked to report the grade point average at the end of the first semester of the 1960-61 academic year for each player, for each course in which he was enrolled, and also to give the grade point average

of the entire class for each course. The grades, as reported by the schools, were changed from a letter to a number system. Under this system the transformation was as follows: A = 4.0; B = 3.0; C = 2.0; D = 1.0. The results of the survey showed that those who participated in basketball and were capable of advancing in athletic competition were above average in academic performance. The grade point results for the 168 players in all courses enrolled averaged 2.556. The grade point results for all members of all classes in which these players were enrolled averaged 2.186.

There were researchers who believed there was no relationship between physical and academic achievement. Landis, Burtl, and Nichols (12) concluded that there was no relationship between physical efficiency and intelligence. Their findings were based on a correlation between physical tests such as running, jumping, throwing and climbing compared to the Ohio State University Intelligence Test.

Ricci (13) conducted research to determine the relationship of physical fitness to the academic success of college freshmen male students at the University of Massachusetts. He found no significant relationship between this groups' physical fitness scores or grade point averages.

Jorgensen (14) investigated the relationship of physical fitness to optimum scholastic achievement. He compared grade point averages with results taken from the

Indiana Motor Fitness Test. No significant relationship was found between grade point averages and physical fitness ratings.

Thompson (15) studied the relationship between performance in selected motor skills and mental achievement for children of elementary age. She reported little evidence of a relationship between motor performance and mental achievement. The highest relationship found was between the hurdle jump and mental items at the sixth grade level.

Bauer (16) investigated the correlation between motor capacity and mental capacity. He concluded that there was no substantiated evidence to indicate that the children with innate potential in the motor area will also have high innate potential in the mental area.

Westendarp (17) found a negative correlation coefficient between physical efficiency as measured by tests of agility, coordination, strength, endurance and speed as compared to mental capacity whether measured by the mental tests of Terman and of Thorndike, or by academic grades in high school.

Johnson (18) agreed that there was little or no relationship between physical skills and intelligence. In his research, the physical skill of an individual was determined by the Johnson Physical Skill Test and intelligence by the 1939 Psychological Examination for College Freshmen, American Council on Education. The conclusions of Johnson's study were:

1. There is no significant relationship between physical skill as measured, and mental power of general intelligence as measured.

2. There is just a meager relationship between intelligence as measured and academic grades.

3. There is no significant relationship between physical skill and academic grades.

4. There is but a hint of a relationship between skill and grade in physical education activities.

Definitions

AAHPER Basketball Skills Test: An instrument designed to measure individual ability in the basic elements of basketball.

Grade Point Average: This is a scholastic average as computed by the grades A = 4, B = 3, C = 2, D - 1, and F = 0. This is a compiled average of all grades received in all courses taken by each subject excluding physical education in this study. The physical education grade was handled separately.

Summary

There has been much controversy through the years whether or not there is a significant relationship between physical ability and academic achievement. Most related literature on the subject divided itself evenly between the two points of view. One viewpoint being that there was a significant relationship between physical ability and academic achievement and the other viewpoint being that there wasn't a relationship.

The purpose of this study was to examine this problem from two different viewpoints. One phase of the problem was to calculate the relationships of basketball skill abilities of sixth and seventh grade boys of Woodside School as compared to their physical education grade point averages. This was done to determine if there was a relationship between physical ability and physical education academic achievement. The other phrase of the problem was to compare their basketball skills scores on the American Association for Health, Physical Education, and Recreation Basketball Skills Test with their academic grade point averages excluding their physical education grades.

CHAPTER II

METHODOLOGY

Introduction

The purpose of this study was two-fold. The first phase of the problem was to determine the relationship of basketball skill ability compared to physical education grade point averages of one hundred sixth and seventh grade boys from Woodside School, Wisconsin Rapids, Wisconsin. The second phase of the problem was to determine the relationship of basketball skill abilities of these same boys with their academic grades. This was done to determine the relationship of physical skill with academic success.

Description of Subjects

The test subjects were all students at Woodside School, Wisconsin Rapids, Wisconsin. They were all enrolled in either grade six or seven. Their ages ranged from age eleven through age fourteen. All one hundred boys were of the Caucasian race. They all participated in physical education class three times per week.

Brief Description of the Test Items in the AAHPER Basketball Skills Test

A complete description of the AAHPER Basketball Skills Test (19) included purpose, equipment needed, rules, and all scoring procedures for each item may be found in Appendix A.

A brief description of the nine items follows:

1. Front shot: The player shot from a spot outside and to the left of the free throw line. Fifteen trials were taken in a series of five at a time. The player was allowed to use any method of shooting. One practice shot was allowed.

2. Side shot: The player shot from a spot near the corner of the court. Ten shots were taken from each side of the basket in a series of ten at a time. The player was allowed to use any method of shooting. One practice was allowed.

3. Foul shot: The player shot from behind the center of the free throw line. Twenty shots were taken in a series of five at a time. The player was allowed to use any method of shooting. One practice shot was allowed.

4. Under Basket Shot: The player stood under the basket and attempted to make as many baskets as possible in thirty seconds. The player was allowed to use any method of shooting. One practice trial was allowed.

5. Speed Pass: The player stood behind a line parallel to and nine feet from a solid smooth wall. Any style of passing was allowed. The player attempted to make ten passes in the least amount of time. One practice trial was allowed.

6. Jump and Reach: The player stood with his side to the wall, knees straight, and feet flat on the floor. The subject reached up as far as possible and made a mark at the top of his reach. The player crouched, swung his arms, and jumped as high as possible and made a second mark on the wall. The distance between the two marks represented the subject's vertical jump. One practice jump was allowed.

7. Overarm Pass for Accuracy: The player stood behind a line parallel to and twenty-five feet from a target marked on a wall. The subject threw the basketball at the target ten times with a single overarm pass. One practice pass was allowed.

8. Push Pass for Accuracy: The player stood behind a line parallel to and twenty-five feet from a target marked on a wall. The subject threw a basketball at a target ten times with a two-handed push pass. One practice pass was allowed.

9. Speed Dribble: The player attempted to dribble in and out alternately between six chairs and return to the finish line with the same procedure in the least amount of time. The chairs were arranged in single file approximately eight feet apart.

Test Administration

The AAHPER Basketball Skills Test was administered in the Woodside School Gymnasium. The Woodside Gymnasium had four baskets and sufficient space to conduct the test. The basketball skill test was administered during regular physical education class periods on April 26, April 28, and April 30.

Two people were needed to administer the test. One person acted strictly as a recorder while the other acted as a tester and timer. One subject was tested at a time. The test administrator gave the same instructions to all the subjects. Upon completion of one skill test item, the entire group moved to the next test item. The data were recorded on individual score cards during the administration of the tests. An example appears in Appendix B.

All the materials needed for the tests were available at the Woodside School. The most important item was

the stop watch. In the underbasket shot, speed pass, and dribble, the times for accomplishing these skills were measured in minutes, seconds, and tenths of seconds. The jump and reach test item was measured to the nearest inch.

The testing was done in an operational setting. It was operational because the Woodside gymnasium was the place most of the boys practiced their basketball skills. There were various items in the testing that the researcher was able to control. The same type and length of warm-up was used before each testing period. The temperature of the gym was controlled in that the temperature remains constant on the gymnasium floor. The equipment was controlled. For example, the same ball and watch were used throughout the testing. The testing sequence was also administered the same for each class. Finally, the method of recording the test scores was also kept constant.

There were a few variables that could not be controlled. For example, not all subjects were tested at the same time of day due to differences in class hours for physical education classes. Another variable that was not controlled was the order of the testing of the individuals themselves. A subject might be the first one tested after warm up one day and the last one during the next testing period. This was dependent on how far the testing had progressed the previous class period for this particular group of subjects. Another variable that could not be

controlled was the type of day the subject was experiencing away from physical education class, whether he was sick, well, depressed or happy.

The grade point averages for each of the one hundred subjects were computed by adding their six academic grades and then dividing this total by six. Their letter grades were first transmitted into numerical grades. The six subjects on which they were graded included: reading, language, spelling, math, science and health, and social studies. The grades used in this study were taken from the six week period in which they were also tested for basketball skill ability. This period ran from March 22nd through April 30, 1971. The physical education grade used in this study was the one received in physical education class during this same six week period which was also converted to a numerical value.

Statistical Procedure

It was assumed, at this time, that the skill test scores would correlate significantly with the physical education grade point averages and the academic grades. The raw scores on the AAHPER test were standardized before a correlation between the skill test scores and the grade point averages could be calculated. The Pearson Product-Moment Formula (20) was used to determine the correlation between the basketball skills test scores and the two sets

of grade point averages.

The type of design used in this project was the single group design because of the presence of the single group from Woodside School. The results pertain only to this non-probability sample.

Summary

The AAHPER Basketball Skills Test which consists of nine basic items, testing basketball skill, was administered to one hundred subjects at Woodside School in Wisconsin Rapids, Wisconsin. The basketball skills scores were recorded along with their physical education grade point averages and academic grade point averages during a six week period in April 1971. It was assumed these three criteria would correlate significantly to demonstrate the researcher's assumption that there was a relationship between physical ability and academic ability.

CHAPTER III

ANALYSIS OF DATA

The Standardization of Scores

Before the basketball skills test results could be correlated with physical education and academic grade point average, they had to be standardized. The raw scores were standardized because the AAHPER Basketball Skills Test contained three different common units of measurement. Because of the lack of national norms for sixth and seventh grade boys for the AAHPER Basketball Skills Test, T-scale norms suitable for this group of one hundred boys at Woodside School were established for the nine test items within the AAHPER Basketball Skills Test. The T-Scale by the Successive Method (21) was used for the establishment of the norms. The procedures for establishing norms for this group may be found in Appendix C. The T-Scale norms may be found in Appendix D. Table 1 contains the mean, standard deviation, and the constant value for each of the nine test items within the AAHPER Basketball Skills Test.

TABLE 1

MEANS, STANDARD DEVIATIONS, AND CONSTANT VALUES USED IN THE ESTABLISHMENT OF NORMS

Test Item	S. D.	Mean	Constant Value	Number
Front Shot	4.92	14	.492	100
Side Shot	5.86	15	.586	100
Foul Shot	3.99	7	.399	100
Under Basket Shot	3.33	8	.333	100
Speed Pass	1.70	12.5	.170	100
Vertical Jump	2.83	14	.283	100
Overarm Pass	2.03	28	.203	100
Push Pass	2.05	29	.205	100
Speed Dribble	1.76	12.9	.176	100

Once the T-Scale norms were established, the T-Scale by Graph Method (21) was used to convert each of the nine raw scores into a "T" score. The "T" scores for all nine test items were then added together to represent the standard score achieved by each individual. These standardized scores were then correlated with the physical education grade point averages and the academic grade point averages.

Results of Basketball Skill - Physical Education Grade Point Average Comparison

The individual basketball skills scores were correlated with the individual physical education grade point averages. The Pearson Product-Moment Formula was used to determine the correlation coefficient between basketball skill and physical education grade point averages for each of the one

hundred subjects may be found on Table 2. The Pearson Product-Moment Formula, procedures and data for determining the basketball skill - physical education correlation coefficient may be found in Appendix E.

The correlation coefficient found between basketball skill and physical education grade point average was 0.62. This correlation coefficient is significant at the 0.01 level (22).

Results of Basketball Skill - Academic Grade Point Average Comparison

The individual basketball skills scores were also correlated with each individual's academic grade point average. The Pearson Product-Moment Formula was also used to determine the correlation coefficient between basketball skill standardized test scores and academic grade point averages. A comparison of academic grade point averages is included on Table 2, which also includes basketball skill scores and physical education grade point averages. The Pearson Product-Moment Formula, procedures, and data for determining the correlation coefficient between basketball skill and academic grade point average may be found in Appendix E.

The correlation coefficient found between basketball skill and academic grade point average was 0.27. This correlation coefficient is also significant at the 0.01 level (22).

TABLE 2

COMPARISON OF INDIVIDUAL BASKETBALL SKILL SCORES, PHYSICAL EDUCATION GRADE POINT AVERAGES AND ACADEMIC GRADE POINT AVERAGES

Subject	Basketball Skill Scores	Phy. Ed.	Academic
1	488	3.00	1.83
2	508	4.00	3.17
3	363	2.00	2.33
4	385	3.00	1.67
5	527	4.00	2.17
6	496	4.00	3.50
7	337	3.00	2.00
8	403	3.00	2.00
9	411	3.00	2.33
10	497	3.00	4.00
11	434	3.00	1.50
12	394	3.00	1.83
13	426	2.00	2.33
14	471	3.00	1.83
15	512	3.00	1.67
16	455	3.00	2.00
17	381	2.00	1.50
18	447	3.00	1.67
19	476	3.00	1.67
20	508	3.00	2.33
21	387	2.00	3.17
22	373	3.00	2.17
23	411	3.00	2.83
24	439	4.00	3.00
25	439	3.00	3.67
26	471	3.00	1.33
27	480	3.00	1.50
28	500	3.00	1.83
29	558	4.00	2.83
30	475	3.00	1.50
31	517	3.00	2.00
32	515	4.00	3.33
33	498	4.00	3.67
34	363	2.00	3.00
35	252	2.00	1.00
36	413	2.00	3.00
37	528	3.00	2.17
38	442	4.00	2.67
39	411	2.00	1.67
40	485	4.00	3.00

TABLE 2 - Continued

Subject	Basketball Skill Scores	Phy. Ed.	Academic
41	332	2.00	1.67
42	402	3.00	2.33
43	342	2.00	3.00
44	436	4.00	3.00
45	466	4.00	3.67
46	514	4.00	3.00
47	489	4.00	2.67
48	478	3.00	2.50
49	449	3.00	2.50
50	462	4.00	1.50
51	399	2.00	2.17
52	368	2.00	1.33
53	319	2.00	1.17
54	319	1.00	2.33
55	322	3.00	3.00
56	393	1.00	2.00
57	459	3.00	1.50
58	457	3.00	2.50
59	494	3.00	2.50
60	413	3.00	3.33
61	491	3.00	2.17
62	521	3.00	2.33
63	530	3.00	2.50
64	415	2.00	1.67
65	442	3.00	2.00
66	443	3.00	1.67
67	509	2.00	2.00
68	484	2.00	3.00
69	484	3.00	2.50
70	529	4.00	2.83
71	503	4.00	4.00
72	485	3.00	2.83
73	528	4.00	2.67
74	495	3.00	2.83
75	503	3.00	2.17
76	452	3.00	2.50
77	394	2.00	2.67
78	464	4.00	1.50
79	384	2.00	3.00
80	421	3.00	1.83
81	503	3.00	2.33
82	426	3.00	3.00
83	529	3.00	3.33
84	437	3.00	2.50
85	568	4.00	2.67

TABLE 2 - Continued

Subject	Basketball Skill Scores	Phy. Ed.	Academic
86	416	3.00	1.50
87	365	3.00	3.33
88	487	4.00	2.00
89	542	4.00	3.17
90	513	3.00	2.67
91	391	2.00	1.00
92	412	2.00	1.83
93	549	4.00	3.17
94	419	3.00	2.50
95	476	4.00	2.17
96	429	3.00	2.83
97	391	3.00	3.17
98	454	3.00	2.00
99	446	4.00	2.33
100	452	3.00	3.83

Summary

The AAHPER Basketball Skills test scores were first standardized before they were correlated with physical education and academic grade point averages. The raw scores were standardized by changing them to T-Scale norms. These standardized scores were then correlated with physical education grade point averages and academic grade point averages. Correlation coefficients of 0.62 and 0.27 were found for basketball Skill - physical education comparison and basketball skill - academic comparison. Both these correlation coefficients proved significant at the 0.01 level.

CHAPTER IV

DISCUSSION

This study was conducted to determine the relationship of basketball skill ability compared to physical education grade point average and academic grade point average. One hundred sixth and seventh grade boys were administered the AAHPER Basketball Skills Test at Woodside School. Their basketball skills scores were then correlated with their physical education grade point averages and their academic grade point averages to determine if there were a relationship between skill and mental achievement.

Basketball Skill - Physical Education Comparison

One hundred subjects were tested for basketball skill ability. T-Scale norms were established for this group in order to standardize scores for easier calculations. The T-Scale norms were not widely spread. This was due to the grouping of scores around the means.

These standardized basketball skills scores were then correlated with the same subjects' physical education grade point averages. The physical education grade point averages fluctuated between 1.00 and 4.00 due to the

subjectivity of the grading teacher. These grades were for the same six week period when the subjects were tested for basketball skill ability.

A correlation coefficient of 0.62 was found between basketball skill and physical education grade point average. This coefficient was found significant at the 0.01 level. Thus, the writer rejected the null hypothesis that there was no relationship between basketball skill and physical education grade point average. The alternate hypothesis was accepted which stated there was a relationship between basketball skill and physical education grade point average for the one hundred boys tested at Woodside School.

Basketball Skill - Academic Comparison

The basketball skill test scores were also correlated with overall academic grade point averages (excluding physical education) for the same six week period. The academic grade point averages included six different academic areas. This was one reason for the wider range of scores than recorded in the physical education grade point averages. These scores also included the subjectivity and biases of six people instead of just one physical education teacher.

A correlation coefficient of 0.27 was found between basketball skill and academic grade point average. This

coefficient was lower than the physical education - basketball skill coefficient. However, it still proved significant at the 0.01 level. The null hypothesis which stated that there was no relationship between basketball skill and academic achievement was rejected. The alternate hypothesis which stated there was a relationship between basketball skill and academic achievement was accepted.

One of the reasons which caused the basketball skill - academic achievement correlation coefficient to be lower than the basketball skill physical education grade point average correlation coefficient was probably the basic interests of each subject. Other factors which affected the lower coefficient were probably likes and dislikes, motivation, and basic ability. Finally, it should be remembered that physical education is much more related to basketball skill than any of the six academic areas.

Summary

The writer correlated basketball skill with physical education grade point average and academic grade point average. Correlation coefficients of 0.62 and 0.27 were found respectively. Both correlations were found to be significant even though a lesser relationship was found between academic grade point average and basketball skill. The writer concluded this was due to a wider range of scores, differences in subjects, and a lesser relationship

of academic grades to basketball skill than physical education grades to basketball skill.

The skills scores were grouped around the mean for this group. The ages of the sample group were such that proficient skills in the basketball area were not as yet developed. Therefore only a slight variability existed in the standardized scores.

It should also be noted from the results of this study that there was a significant relationship between physical skill and academic achievement. Down through the years there has been much controversy concerning the athlete's accomplishments in the classroom. As stated earlier in this paper, there have been other researchers who have attempted to show a relationship between physical skill and academic achievement. Their results have been almost evenly split between there being a relationship and there being no relationship. The results of this study showed a significant relationship and thus add to the positive research done on this problem.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was two-fold. The first phase of the problem was to compare physical education grade point averages with basketball skill ability using the AAHPER Basketball Skills Test. The second phase was to compare academic achievement using academic grade point averages with basketball skill ability. An experimental group of one hundred sixth and seventh grade boys at Woodside School were used in the study.

The physical education grade point averages and standardized basketball skills test scores were correlated by the Pearson Product-Moment Formula to determine the correlation coefficient between the two variables. The correlation coefficient was found to be 0.62.

The academic grade point averages and standardized basketball skills test scores were also correlated by the Pearson Product-Moment Formula to determine the correlation coefficient between basketball skill and academic achievement. The correlation coefficient was found to be 0.27.

Conclusions

The following conclusions appear justified by the analysis of the data obtained from this study:

1. There was a significant relationship between physical education grade point average and basketball skill as measured through the AAHPER Basketball Skills test for one hundred sixth and seventh grade boys at Woodside School.

2. There was a significant relationship between academic grade point average and basketball skill as measured through the AAHPER Basketball Skills Test for one hundred sixth and seventh grade boys at Woodside School.

Recommendations

The following recommendations were made as a result of this study:

1. National norms for junior-high-school-age boys should be established for the AAHPER Basketball Skills Test.

2. This type of study should be expanded using physical education grade point averages and academic grade point average over a longer period of time.

3. This type of study should be expanded to include correlations with personality and IQ.

APPENDIX A

APPENDIX A

COMPLETE DESCRIPTION OF THE AAHPER BASKETBALL SKILLS TEST

1. Front Shot

Purpose: To measure the player's skill in making shots at the basket from a designated spot at the left front of the basket.

Equipment: Standard inflated basketballs, standard goals.

Description: The player shoots from a spot just outside of the free throw circle where the free throw line intersects the circle. This point is on the left facing the basket. A mark should be drawn on the floor. Any method of shooting with one or both hands may be used. The player should try to make the shot without hitting the backboard. Fifteen trials are taken in series of five at a time. The player must leave the spot at the end of each five shots and move around or let another player take his first series of shots before continuing. A practice shot is allowed.

Rules:
1. Players must shoot from the shooting spot only.
2. Fifteen shots are taken in all.

Scoring: Two points are counted for each basket made, regardless how the ball goes in. One point is counted for shots which hit the rim but do not go in the basket, provided the ball hits the rim before hitting the backboard. Balls which hit the backboard first and do not go in the basket do not count any points. Record the points as made on each shot, and then total the points for the final score. The maximum score that may be made on the fifteen shots is 30 points.

2. Side Shot

Purpose: To measure the player's skill in shooting baskets from the side, near the corners of the court.

Equipment: Standard inflated basketballs, standard goals.

Description: The player shoots from a spot near the corner of the court, at the side of the basket, and behind a line 20 feet from the center of the basket. Either one- or two-handed shots may be used. The player shoots 10 times from one side of the basket and then moves to the other side for 10 shots. A practice shot is allowed.

Rules:
1. Shots must not be taken closer than 20 feet from the basket.
2. Ten shots from each side are taken.

Scoring: Count two points for each goal made and one point for balls which hit the rim of the basket but do not go in, even though they may have hit the backboard also. Score each shot as made and then total the points for the final score. The maximum score possible is 40 points on the 20 shots.

3. Foul Shot

Purpose: To measure skill in shooting free throws (shooting fouls) from the free throw line.

Equipment: Standard inflated balls, standard goals.

Description: The player shoots from behind the center of the free throw line. The player may shoot by any method preferred. Twenty shots are taken in series of five at a time. The player must leave the foul line at the end of each five shots and move around or let another player take his shots before continuing with his next series of shots. A practice shot is allowed.

Rules:
1. Twenty shots are taken in all.
2. The player may place his feet in any position, behind the line.

Scoring: Score one point for each goal made regardless of how the ball goes in. Count each shot as 1 or 0 recording the points in lines of five on the squad score card. Record the total score made. The maximum possible score is 20 points.

4. Under Basket Shot

Purpose: To measure skill with which a player can shoot, recover, and shoot from a position directly under the basket.

Equipment: Standard basketball court, standard inflated balls, standard goals, stop watch or watch with sweep-second hand.

Description: The player stands under the basket holding a basketball. On the signal "go" the player starts making one-hand or two-hand lay-up shots, recovering the ball, and shooting again as rapidly as possible, trying to make as many goals as possible within 30 seconds. The player is timed from the signal "go" and is stopped on the signal "stop." A practice trial is allowed.

Rules:
1. The ball may be shot in any manner.
2. After shots are made or missed the player recovers the ball and continues shooting.
3. If the player loses the ball entirely, he may start over again, but only once.
4. Two complete trials are allowed.

Scoring: One point is scored for each basket made. The score on the test is the number of baskets made in 30 seconds. Two trials are recorded on the squad card, and the best trial is the player's score.

5. Speed Pass

Purpose: To measure speed with which a player can continue to pass and catch a ball.

Equipment: A level floor or ground and a wall with smooth surface, stop watch, standard inflated basketballs.

Description: The player stands behind a line on the floor parallel to and 9 feet from a solid smooth wall. On the signal "go" the player passes the ball against the wall, about head high, catches the rebound, and continues passing against the wall as rapidly as possible until ten passes have hit the wall. Any method of passing may be used, but the push pass is faster. A practice trial is allowed.

Rules:
1. All passes must be made from behind the line.
2. The ball cannot be batted, but must be caught and passed.
3. The ball can hit the wall at any height.
4. If the ball is dropped, the player must recover it and continue from behind the line until he has hit the wall ten times.

Scoring: The test is timed from the instant the first pass hits the wall until the tenth pass hits the wall (the player starts on the signal "go" but the watch is not started until the ball hits the wall). Record the time in seconds and tenths. Two complete trials should be recorded. The score is the best time required to complete ten passes against the wall.

6. Jump and Reach

Purpose: To measure the height of a player's jump over and above his reach.

Equipment: A level floor and a smooth wall surface upon which chalk marks can be made, pieces of shalk three-fourths inches long, yard stick. (Some schools may have a prepared target for the jump and reach test, which can be used.)

Description: The player, holding a small piece of chalk in his fingers, stands with his side to the wall with knees straight and feet flat on the floor. He reaches up as far as possible and makes a mark on the wall at the top of his reach. The player then crouches, swings his arms, jumps as high as possible, and makes a second mark on the wall. The distance between the first and second marks on the wall is measured with a yard stick to the nearest inch. A practice jump is allowed.

Rules:
1. The player must stand flat-footed with knees straight in making the first mark.
2. The jump must be made from both feet without a hop.
3. Two trials are taken.

Scoring: The score is the distance between the mark at the top of the reach and the mark at the top of the jump. Yard stick must be perpendicular to the floor when measuring the distance between marks. Record the distance to the nearest inch. The distance of the jump on two separate trials is recorded. The score is the best of two trials.

7. Overarm Pass for Accuracy

Purpose: To measure the accuracy with which a player can make a single overarm pass at a target.

Equipment: Standard inflated basketballs; a target painted or marked on a wall or a mat, or on a piece of canvas hung on a smooth wall; chalk, measuring tape. The floor should be properly measured and marked, as in the diagram.

Description: The player, with a basketball, stands behind a line parallel to and 35 feet from the target marked or hung on a wall. The player throws the ball single overarm at the target. The target is circular with three concentric circles separated by one-inch wide white or black lines. The inner circle is 18 inches in diameter, the next circle is 38 inches in diameter, and the outer circle is 3 feet above the floor. A practice pass is allowed.

Rules:
1. The ball can be held in both hands prior to the throw.
2. The throw must be made from behind the line.
3. The player may take a step in throwing, but both feet must be behind the throwing line.
4. Ten passes are taken.

Scoring: Three points are scored for balls hitting in the center circle, two points for balls hitting in the next circle, and one point for balls hitting in the outer circle. Balls hitting on a line count as hitting in the area of the higher score. Points as made on each throw should be recorded, and the total is the score. The maximum possible score is 30 points made on ten passes at the target.

8. Push Pass for Accuracy

Purpose: To measure accuracy with which a player can make a two-hand push pass at a target.

Equipment: Standard inflated basketballs; a target painted or marked on a wall or on a mat, or on a piece of canvas hung on a smooth wall; chalk; measuring tape. The floor should be properly measured and marked, as in the diagram.

Description: The player with a basketball stands behind a line 25 feet from and parallel to the face of the target marked or hung on a wall. The player uses a two-hand push pass (chest pass) and endeavors to hit the center of the target. The target is the same as used for the overarm pass in Test #7. A practice pass is allowed.

Rules:
1. Passes must be made with both feet behind the passing line.
2. The two-hand push, or chest, pass must be used.
3. Ten passes are taken.

Scoring: Three points are scored for balls hitting in the center circle, two points for balls hitting in the next circle, and one point for balls hitting in the outer circle. Hits on a line count as in the next higher area. Points as made on each pass should be recorded, and the total is the score. The maximum possible score is 30 points made on ten passes at the target.

9. Dribble

Purpose: To measure the speed with which a player can dribble a ball around obstancles.

Equipment: Standard inflated basketballs, stop watch, six chairs arranged as in the diagram.

Description: The player stands behind the starting line with a ball in hand and on the signal "go" starts with a dribble on the right of the first chair and continues to dribble in and out alternately around the remaining five chairs and returns to cross the starting line. The chairs are arranged single file in a straight line so that the front of the first chair is 5 feet from the starting line and the following chairs are 8 feet apart, measured from the front of each chair. All chairs have backs toward the starting line. The over-all distance from the starting line to the far edge of the sixth chair is 45 feet. A practice trial is allowed.

Rules:
1. The ball may be dribbled with either hand.
2. Legal dribbles must be used.
3. The ball must be dribbled at least once as each chair is passed, but need not be dribbled opposite a chair.
4. Each player is allowed two trials.

Scoring: The score is the time in seconds and tenths that it takes to dribble around between the chairs and back. Time is started on the signal "go" and stopped the instant the player crosses the starting line at the end of the trip. Two trials are timed and recorded. The best time of the two trials is the player's score on the test.

APPENDIX B

SAMPLE SCORECARD FOR THE AAHPER BASKETBALL SKILLS TEST

AAHPER SPORTS SKILLS TEST	BASKETBALL	PERSONAL SCORECARD

NAME: _____ DATE: _____

Front Shot	Side Shot	Foul Shot	Under Shot	Speed Pass	Jump & Reach	Overarm Pass	Push Pass	Speed Dribble

APPENDIX C

APPENDIX C

Construction of Norms (Successive Method) for the AAHPER Basketball Skills Test (23)

Procedure:

Step 1 - The mean of the raw score distribution for each test item on the AAHPER Basketball Skills test was determined.

Step 2 - The standard deviation of the raw score distribution for each test item on the AAHPER test was determined.

Step 3 - The constant value for each test item on the AAHPER test was determined.

Step 4 - The constant value was added and subtracted successively from the mean of the raw score distribution for each test item to get each step along the T-Scale.

Formula:

$$\text{Constant Value} = \frac{5\ (\text{S.D.})}{50}$$

APPENDIX D

APPENDIX D

NORMS FOR THE AAHPER BASKETBALL SKILLS TEST FOR SIXTH AND SEVENTH GRADE BOYS AT WOODSIDE SCHOOL

Standard Score	Front Shot	Side Shot	Foul Shot	Under Basket Shot	Speed Pass	Jump and Reach	Overarm Pass	Push Pass	Speed Dribble
100									
99									
98				24					
97									
96									
95				23					
94									
93									
92				22		26			
91									
90									
89				21	6.0				6.4
88					6.2	25			6.6
87		40			6.4				6.8
86		39		20	6.5				6.9
85					6.6	24			7.0
84		38			6.8				7.2
83		37	20	19	7.0				7.4
82					7.2				7.6
81		36			7.4	23			7.8
80		35	19	18	7.5				7.9
79					7.6				8.0
78	30	34	18		7.8	22			8.2
77		33		17	8.0				8.4
76	28				8.2				8.6

NORMS FOR THE AAHPER BASKETBALL SKILLS TEST FOR
SIXTH AND SEVENTH GRADE BOYS AT WOODSIDE SCHOOL
Continued

Standard Score	Front Shot	Side Shot	Foul Shot	Under Basket Shot	Speed Pass	Jump and Reach	Overarm Pass	Push Pass	Speed Dribble
75		32	17		8.4				8.8
74	26	31		16	8.5	21			8.9
73			16		8.6				9.0
72	25	30			8.8				9.2
71		29		15	9.0	20			9.4
70	24		15		9.2				9.6
69		28			9.4				9.8
68	23	27	14	14	9.5				9.9
67					9.6	19			10.0
66	22	26			9.8				10.2
65		25	13	13	10.0				10.4
64	21				10.2	18			10.6
63		24	12		10.4				10.8
62	20	23		12	10.5				10.9
61					10.6				11.0
60	19	22	11		10.8	17	30		11.2
59		21		11	11.0				11.4
58	18		10		11.2				11.6
57		20			11.4	16			11.8
56	17	19		10	11.5				11.9
55			9		11.6		29	30	12.0
54	16	18			11.8				12.2
53		17	8	9	12.0	15			12.4
52	15				12.2				12.6
51		16			12.4				12.8
50	14	15	7	8	12.5	14	28	29	12.9
49		14			12.6				13.0

NORMS FOR THE AAHPER BASKETBALL SKILLS TEST FOR SIXTH AND SEVENTH GRADE BOYS AT WOODSIDE SCHOOL
Continued

Standard Score	Front Shot	Side Shot	Foul Shot	Under Basket Shot	Speed Pass	Jump and Reach	Overarm Pass	Push Pass	Speed Dribble
48	13		6		12.8				13.2
47		13		7	13.0	13			13.4
46	12	12			13.2				13.6
45			5		13.4		27	28	13.8
44	11	11		6	13.5				13.9
43		10	4		13.6	12			14.0
42	10				13.8				14.2
41		9		5	14.0				14.4
40	9	8	3		14.2	11	26	27	14.6
39					14.4				14.8
38	8	7	2	4	14.5				14.9
37		6			14.6				15.0
36	7				14.8	10			15.2
35		5	1	3	15.0		25	26	15.4
34	6	4			15.2				15.6
33					15.4	9			15.8
32	5	3		2	15.5				15.9
31		2			15.6				16.0
30	4				15.8		24	25	16.2
29				1	16.0	8			16.4
28	3	1			16.2				16.6
27					16.4				16.8
26	2				16.5	7			16.9
25					16.6		23	24	17.0
24	1				16.8				17.2
23					17.0				17.4
22					17.2	6			17.6
21					17.4				17.8
20					17.5		22	23	17.9

NORMS FOR THE AAHPER BASKETBALL SKILLS TEST FOR SIXTH AND SEVENTH GRADE BOYS AT WOODSIDE SCHOOL
Continued

Standard Score	Front Shot	Side Shot	Foul Shot	Under Basket Shot	Speed Pass	Jump and Reach	Overarm Pass	Push Pass	Speed Dribble
19					17.6	5			18.0
18					17.8				18.2
17					18.0				18.4
16					18.2				18.6
15					18.4	4	23	22	18.8
14					18.5				18.9
13					18.6				19.0
12					18.8	3			19.2
11					19.0				19.4
10					19.2		22	21	19.6
9					19.4				19.8
8					19.5	2			19.9
7					19.6				20.0
6					19.8				20.2
5					20.0	1	21	20	20.4
4					20.2				20.6
3					20.4				20.8
2					20.5				20.9
1					20.6				21.0
0					20.8		20	19	21.2
N	100	100	100	100	100	100	100	100	100
M	14	15	7	8	12.5	14	28	29	12.9
S.D.	4.92	5.86	3.99	3.33	1.70	2.83	2.03	2.05	1.76
Test Max	30	40	20	U.L.	U.L.	U.L.	30	30	U.L.
High Score	25	30	20	17	9.5	22	30	30	9.8
Low Score	2	2	0	1	22.0	6	22	19	18.0
Range	23	28	20	16	12.5	16	8	11	8.2

APPENDIX E

APPENDIX E

STATISTICAL PROCEDURE USED TO DETERMINE THE CORRELATION COEFFICIENT BETWEEN BASKETBALL SKILL AND PHYSICAL EDUCATION GRADE POINT AVERAGE

Procedure:

Step 1 - The sum of the X scores was determined. (ΣX)

Step 2 - The sum of the Y scores was determined. (ΣY)

Step 3 - The sum of the X scores squared was determined. (ΣX^2)

Step 4 - The sum of the Y scores squared was determined. (ΣY^2)

Step 5 - The sum of the X scores multiplied by the Y scores was determined. (ΣXY)

Step 6 - The data was substituted into the Pearson Product-Moment Formula.

Data:

$\Sigma X = 44881$ $\Sigma Y = 300.00$

$\Sigma X^2 = 20515775$ $\Sigma Y^2 = 952.0000$

$\Sigma XY = 137391.00$

Pearson Product-Moment Formula:

$$r = \frac{\Sigma XY - \frac{(\Sigma X)(\Sigma Y)}{N}}{\sqrt{\left(\Sigma X^2 - \frac{(\Sigma X)^2}{N}\right)\left(\Sigma Y^2 - \frac{(\Sigma Y)^2}{N}\right)}}$$

Calculations:

$$r = \frac{137391.00 - \frac{(44881)\ (300.00)}{100}}{\sqrt{\left(20515775 - \frac{2014304161}{100}\right)\left(952 - \frac{90000}{100}\right)}}$$

$$r = \frac{2748}{4403} = .62$$

STATISTICAL PROCEDURE USED TO DETERMINE THE CORRELATION COEFFICIENT BETWEEN BASKETBALL SKILL AND ACADEMIC GRADE POINT AVERAGE

Procedure:

Step 1 - The sum of the X scores was determined. (ΣX)

Step 2 - The sum of the Y scores was determined. (ΣY)

Step 3 - The sum of the X scores squared was determined. (ΣX^2)

Step 4 - The sum of the Y scores squared was determined. (ΣY^2)

Step 5 - The sum of the X scores multiplied by the Y scores was determined. (ΣXY)

Step 6 - The data was substituted into the Pearson Product-Moment Formula

Data:

$\Sigma X = 44881$ $\Sigma Y = 239.98$

$\Sigma X^2 = 20515775$ $\Sigma Y^2 = 614.9451$

$\Sigma XY = 108747.96$

Pearson Product-Moment Formula:

$$r = \frac{\Sigma XY - \frac{(\Sigma X)(\Sigma Y)}{N}}{\sqrt{\left(\Sigma X^2 - \frac{(\Sigma X)^2}{N}\right)\left(\Sigma Y^2 - \frac{(\Sigma Y)^2}{N}\right)}}$$

Calculations:

$$r = \frac{108747.96 - \frac{(44881)(239.98)}{100}}{\sqrt{\left(20515775 - \frac{2014304161}{100}\right)\left(614.9451 - \frac{57588.0904}{100}\right)}}$$

$$r = \frac{1043}{3816} = .27$$

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