

AN EVALUATION OF THE BASIC PHYSICAL EDUCATION COURSE
FOR WOMEN MAJORS AT KANSAS STATE UNIVERSITY

by *X589*

JUDY ANN AKERS

B. S., Kansas State University, 1967

A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Physical Education

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1970

Approved by:


Major Professor

LD
2668
T4
1970
A42
C.2

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	iv
LIST OF TABLES	v
Chapter	
1. THE PROBLEM AND DEFINITIONS OF TERMS USED	1
The Problem	1
Statement of the Problem	1
Hypotheses	1
Assumptions	2
Delimitations	2
Limitations	2
Definitions of Terms Used	3
2. REVIEW OF LITERATURE	4
Literature Concerned With an Exemption Level	4
Literature Concerned With Skill Tests	5
3. METHOD OF STUDY	6
4. ANALYSIS AND INTERPRETATION OF DATA	10
5. SUMMARY AND CONCLUSIONS	15
6. SUGGESTIONS FOR FURTHER STUDY	16
BIBLIOGRAPHY	17
APPENDIXES	20
A. The Volleyball Serve Test	21

APPENDIXES

Page

B. Scorecards Used in Volleyball Tests	22
C. The Repeated Volleying Test	23
D. The Softball Repeated Throw Test	24
E. Scorecards for Softball and Field Hockey Tests	25
F. The Field Hockey Test	26

ACKNOWLEDGMENTS

To:

The students who made this experiment possible,
Miss Sandra Hick who assisted in the testing and instructing
of the subjects,

Mrs. Henrietta Gale for her time and assistance at the computer
center, and

Professor Raymond A. Wauthier, whose assistance in the final
writing made this study a reality,
this thesis is gratefully dedicated.

LIST OF TABLES

Table	Page
1. "t" Test for First and Second Test	10
2. "t" Test Above and Below the First Mean	12
3. Percentile Ranks	14

Chapter 1

THE PROBLEM AND DEFINITIONS OF TERMS USED

With the increased number of students enrolled in colleges and universities, plus the lack of facilities, equipment, staff and financial support, it is almost impossible to accommodate the number of students in our major and basic physical education programs.

This situation is developing here at Kansas State University and unless financial support for increased staff and facilities are made available some procedure will have to be devised whereby this situation can be alleviated. With this in mind it was decided to evaluate our present basic physical education class for women majors to see if a level could be established to exempt those with a high level of ability in physical activities.

The Problem

Statement of the Problem

The purpose of the study was to determine if time spent in the present major basic physical education class would show a significant improvement in their skill level and to ascertain a level of exemption for those students showing an above average performance level.

Hypotheses

The hypotheses adopted for this experiment were the following:

- (1) There would be no significant difference of skill level between the first and second battery of tests.

(2) The subjects scoring above the mean will show less improvement than those below the mean.

(3) That the lack of improvement will be due to the large number of students, limited amount of time, and the varying range of abilities.

Assumptions

The following assumptions were made concerning the experiment. The volleyball serve test was a valid measure of the subject's ability to serve. The volleyball repeated volley test was a valid measure of their throwing and catching ability. The field hockey ball control test was a valid measure of their dribbling, dodging, and driving ability. Instruction for learning the skills were the same for all the subjects involved in the study.

Delimitations

All subjects involved in this experiment were female, seventeen to twenty years of age, women physical education majors, and enrolled in a major basic physical education class under the instruction of Miss Sandra Hick. Those subjects enrolled as a minor in the curriculum and those not finishing the testing due to illness or injury were excluded from this experiment.

Limitations

There was no control of the subject's socio-economic backgrounds, diet, or sleep.

A limited amount of control over practice outside of the regular class sessions was possible. The control of attitude toward the

activities and tests were limited.

Junior and senior physical education majors were used as recorders and counters during the testing.

Definitions of Terms Used

Volleyball Serve. A method used to start the play usually accomplished by one of the three methods; underhand, overhand, and sidearm.

Overhead Volley. A method of hitting the ball back and forth across the net after the initial serve.

Softball Throw. A throw which is executed with arm raised above the shoulder.

Catching. The method used to receive the ball.

Field Hockey Dribble. "A series of short taps on the ball so a player can "carry the ball."¹

Field Hockey Dodge. A way the player with the ball avoids an opponent or obstacle.

Field Hockey Drive. "Powerful stroke used for passing and shooting."²

¹Maryhelen Vannier and Hally Beth Poindexter, Individual and Team Sports for Girls and Women (Philadelphia and London: W. B. Saunders Company, 1960), p. 368.

²Vannier and Poindexter, p. 370.

Chapter 2

REVIEW OF LITERATURE

This study was undertaken to determine if there was a significance at the .01 level between the first and second testings; to determine if a significance at the .01 level existed between the group above the initial mean and below the mean; to ascertain a level of exemption. The following is a brief summary of literature pertaining to the subject matter of the study.

Literature Concerned With an Exemption Level

Studies concerned with an exemption program for women physical education majors is almost nonexistent. No work has been done in attempting to establish an exemption level. Physical Education literature from 1950 to the present date has been reviewed in hopes material on this matter could have been found.

In 1951, a study on an "Experiment in Homogeneous Grouping and Its Effect on Achievement in Sports Fundamentals" was conducted.¹ Two special sports fundamentals classes, one for superior performers, one for inferior performers, and one regular class were set up. Approximately 50 percent of the highest and the lowest scoring students on

¹Arleene Lockhart and Jane Mott, "An Experiment in Homogeneous Grouping and Its Effect on Achievement in Sports Fundamentals," Research Quarterly, 22:58-62, 1951.

the Scott Motor Ability Test enrolled in the appropriate special class sections. At the end of nine weeks they were retested.

The superior performers benefited to a statistically significant extent by being segregated. Scores of inferior performers were not influenced by membership in a special class. Written comments of both experimental classes indicated that the great majority preferred to enroll in a sports fundamentals class limited to persons of similar ability.

Literature Concerned With Skill Tests

Physical education skill tests material was reviewed in order to secure a battery for testing. Those selected were proposed by Russell Lange for volleyball skills and Scott and French for softball and field hockey. These particular tests seemed highest in validity and reliability to fit the pattern for skill tests which would rank for this particular study.

Chapter 3

METHOD OF STUDY

The subjects involved in this study were enrolled in the women's basic physical education course for majors, fall 1969, at Kansas State University. The subjects were two junior college transfers, two sophomores and 47 freshmen assigned to the class which met at 10:30 A.M. Tuesdays and Thursdays. They were seventeen to twenty years of age. The total number completing the battery of tests was 45 out of a class enrollment of 51. Six subjects were dropped from the testing because of absence, injury and extended illness.

At the onset of the experiment the subjects were not informed that they were part of this experiment nor that they would be retested. They were asked to attend class regularly and not encouraged to practice the skills outside of class. The attendance was good except for two who did not complete the testing and are not used in this experiment.

The battery of tests were begun on the first day of class and ended on the fourth day. Each subject took part in the Russell Lange Volleyball Serve Test, Appendix A. Two trials of ten serves each were given and the sums of the scores in the areas for the best trial was recorded.¹

Donald K. Mathews, Measurement in Physical Education
(Philadelphia and London: W. B. Saunders Company, 1963), p. 184, 185.

The Russell Lange Volleyball Serve Test has a reliability coefficient ranging from .870 to .915. Validity of the test was determined through subjective rating of the players by seven judges. The results coefficient was .677 for the serve test.

Three persons were used to administer the test. One, an instructor in the women's physical education department and two senior assistants. The instructor placed herself three feet off the floor halfway between the net and end line on the marked side of the court. One assistant watched the serving area for foot faults. The other assistant placed herself directly opposite the instructor to determine the precise landing of the ball. The scorecard used for this test is shown in Appendix B.

The next test given was the the Russell Lange Repeated Volleying Test, Appendix C. The score was the number of times the ball was clearly batted from behind the restraining line and above the net line. The total score from the best of three trials was recorded.²

The Russell Lange Repeated Volleying Test validity was determined through subjective rating of the players by seven judges. The results were .80 for the repeated volleying test.

Five persons were used to administer this test. Two subjects were tested at the same time. The writer started the stop watch for both subjects. Two senior assistants were used at each station, one to watch for foot faults and the other to count the number of legal volleys. The scorecard used for this test is shown in Appendix B.

²Mathews, p. 184, 185.

Next, the Scott and French Softball Repeated Throw Test, Appendix D, was given. This test was administered indoors using a cement wall for rebounds. One point was counted each time the ball was hit on or above the 7 1/2 foot line behind the restraining line. The score for the entire test was the total of six trials of thirty seconds each.³

The Scott and French Softball Repeated Throws Test has a reliability of .94. The validity coefficient was .51 with a subjective rating criterion. The comparatively low validity was explained by the fact that the same person did not make all the ratings. Higher validities should be obtained from more experienced players.

Five persons were again used in order to test two subjects at the same time. The writer signaled, Ready, Go! and assumed the responsibility of the stop watch. Two senior assistants were used, one to count the number of legal hits and the other to watch for foot faults. The scorecard used for this test is shown in Appendix E.

The last test given was the Scott and French Field Hockey Ball Control Test, Appendix F. The score for one trial was the time it took from the signal Go! until the subject's ball had again crossed the starting line. The score for the entire test was the average of the six trials.⁴

³Gladys M. Scott and Esther French, Measurement and Evaluation in Physical Education (Dubuque, Iowa: W. M. C. Brown Company Publishers, 1959), p. 199.

⁴Scott and French, p. 169, 170.

The reliability for the ball control test was .82 with a validity of .56.

One instructor of the women's physical education department and the writer administered this test. Two stations were used simultaneously. Each instructor used a senior assistant to record the times. The scorecard used for this test is shown in Appendix E.

When the initial testing ended, twenty-nine class periods remained in the semester. Eleven class periods were devoted to volleyball skills using the tenth and eleventh days for retesting. Nine class periods were given to softball skills using the ninth day for retesting. Ten class periods were devoted to field hockey skills using the tenth day for retesting.

The class instructions and practice periods were conducted approximately in the same manner for all sports concerned in this experiment. The class was divided into seven groups and remained in these groups throughout the semester.

Skill introduction was a brief explanation and demonstration. The groups were then sent to stations to practice the skills. As new skills were added they would rotate from one area to another. The instructor and writer circulated from station to station to offer criticism and suggestions for improvement. Every other day or so game situations or lead up games were added towards the end of a period. Approximately ten minutes each day was devoted to the skills they had been tested on.

At the end of each activity the subjects were retested in that particular sport before going to the next. The testing procedures and personnel were the same as for the initial testing.

Chapter 4

ANALYSIS AND INTERPRETATION OF DATA

To determine if there was a significant difference in the means of the two tests for each sport, the "t-test for two related samples"¹ was used. This information is shown in Table 1.

Table 1

"t" Test for First and Second Test

Volleyball Serve Test			
Mean (1)	Mean (2)	"t"	Level of significance *
25.956	29.622	3.245	.01
Repeated Volley Test			
31.178	33.244	3.312	.01
Repeated Throw Test			
84.311	81.733	-1.738	none
Field Hockey Test			
15.733	13.044	7.761	.01

* Null Hypothesis

¹John T. Roscoe, Fundamental Research Statistics for the Behavioral Sciences (New York: Holt, Rinehart and Winston, 1969), pp. 170-173.

A "t" of 3.245 appeared for the volleyball serve tests. This difference was significant at the .01 level. A "t" of 3.312 appeared for the repeated volley tests. This difference was significant at the .01 level. A "t" of -1.738 appeared for the repeated softball throw test. This difference was not significant at the .10 level. A "t" of 7.761 appeared for the field hockey ball control test. This difference was significant at the .01 level. In all tests, except the repeated softball test, the second mean was larger and a significant improvement was shown at the .01 level.

In order to show a level of significance for those above and below the mean of the first tests the "t" - test was again used to determine this. This information is listed in Table 2.

The twenty-eight subjects above the mean on the first volleyball serve test showed a "t" of 0.884. This difference was not significant at the .10 level.

The seventeen subjects below the mean had a "t" of 4.964. This difference was significant at the .01 level.

The twenty-two subjects above the mean on the first repeated volley test showed a "t" of 1.327 and was not significant at the .10 level. The twenty-three subjects below the mean showed a "t" of 3.346. This difference was significant at the .01 level.

The twenty-four subjects above the mean for the first repeated softball throw test showed a "t" of -4.861. The difference was not significant at .10 level. The twenty-one subjects below the first mean showed a "t" of 1.633. This difference was significant at the .10 level.

Table 2

"t" Test Above and Below the First Mean

Volleyball Serve Test				
Means Above		DF	"t"	Level of Significance *
(1)	(2)			
31.143	32.357	27	0.884	none
Means Below		DF	"t"	Level of Significance *
(1)	(2)			
17.412	25.118	16	4.964	.01
Repeated Throw Test				
Means Above		DF	"t"	Level of Significance *
(1)	(2)			
37.864	39.000	21	1.327	.10
Means Below		DF	"t"	Level of Significance *
(1)	(2)			
24.783	27.739	22	3.346	.01
Repeated Throw Test				
Means Above		DF	"t"	Level of Significance *
(1)	(2)			
96.167	88.500	23	-4.861	none
Means Below		DF	"t"	Level of Significance *
(1)	(2)			
70.762	74.000	20	1.633	.10
Field Hockey Test				
Means Above		DF	"t"	Level of Significance *
(1)	(2)			
13.864	11.500	21	6.973	.01
Means Below		DF	"t"	Level of Significance *
(1)	(2)			
17.522	14.522	22	5.030	.01

*Null Hypothesis

The twenty-two subjects above the mean on the first field hockey ball control test showed a "t" of 6.973. This difference was significant at the .01 level.

These results showed that the groups above the first mean on all tests, except the field hockey, did not show a significance at .01 level. The subjects below the first means, except the softball tests, showed a significance at the .01 level.

To help determine an exemption level percentile, T-Scores and Z-Scores were figured. These were figured on a "normalized standard score distribution."² The T and Z-Scores were used by the instructor and writer to compare the class to national norms. These were not used to determine the results of the study. The percentile ranks were used as shown in Table 3. Literature relating to evaluation methods in physical education was reviewed. Several suggested this "percentile ranking"³ method.

Percentile ranks in Table 3 show the number of subjects in each skill test and their ranking in the class. Considering the non-significant improvement of those above the mean an exemption level could be set anywhere above the 50 percentile rank.

²Roscoe, pp. 67-69.

³Harold M. Barrow and Rosemary McGee, A Practical Approach to Measurement in Physical Education (Philadelphia: Lea and Febiger, 1964), pp. 227-232.

Table 3
Percentile Ranks

Test	100-81	80-61	60-41	40-21	21-1
Volleyball Serve	9	7	11	8	10
Repeated Volley	9	9	10	8	9
Softball Throw	7	11	8	10	9
Field Hockey	6	9	14	6	10

Chapter 5

SUMMARY AND CONCLUSIONS

It was hypothesized that there would be no significant difference between the first and second tests. The results showed a significance at the .01 level for the volleyball serve, repeated volley and field hockey tests. The repeated softball throw test was the only test that showed no significance at the .01 level.

It was also hypothesized that the subjects above the first mean would show a non-significant improvement compared with those below the mean. Results showed there was a significant improvement at the .01 level for those below the means except the softball throw. The field hockey group above the mean was the only one to show a significance at the .01 level.

The percentile ranks were figured so an exemption level could be set. Because of the significant findings the results of the t-test above and below the mean seem a good argument for exempting those who are above the 80 percentile. It appears that those scoring above the 80 percentile could be exempted from that particular sport since their improvement was not significant.

Chapter 6

SUGGESTIONS FOR FURTHER STUDY

This study is only a beginning in the attempt to establish an exemption program in the women's basic major physical education class. The following are suggestions for further study in this area:

(1) To continue with research and further testing to improve upon an exemption level.

(2) To establish a level the low ability group must reach in order to continue in the physical education curriculum.

These four activities were studied because they are presently offered in the fall semester. All activities need the same type of study.

In addition to the ability level based on skill, a knowledge test needs research.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Barrow, Harold M., and Rosemary McGee. A Practical Approach to Measurement in Physical Education. Philadelphia: Lee and Febiger, 1964.
- Bassett, Gladys, Ruth Glassow and Mabel Locke. "Studies in Testing Volleyball Skill," Research Quarterly, December, 1937.
- Brady, George. "Preliminary Investigations of Volleyball Playing Ability," Research Quarterly, March, 1945.
- Broer, Marion R. Efficiency of Human Movement. Philadelphia: W. B. Saunders Company, 1960.
- Clarke, Harrison H. Application of Measurement to Health and Physical Education. Englewood Cliffs, New Jersey: Prentice-Hall, 1967.
- Garrett, Henry and R. S. Woodworth. Statistics in Psychology and Education. New York: David McKay Company, 1958.
- Lockhart, Arleene and Jane Mott. "An Experiment in Homogeneous Grouping and Its Effect on Achievement in Sports Fundamentals," Research Quarterly, March, 1951.
- Mathews, Donald K. Measurement in Physical Education. Philadelphia and London: W. B. Saunders Company, 1963.
- McGraw, L. W. "A Comparison of Methods of Measuring Improvement," Research Quarterly, May, 1951.
- Meyer, Margaret and Marguerite Schwarz. Team Sports for Girls and Women. Philadelphia and London: W. B. Saunders Company, 1965.
- Roscoe, John T. Fundamental Research Statistics for the Behavioral Sciences. New York: Holt, Rinehart and Winston, 1969.
- Scott, Gladys M. Research Methods in Health, Physical Education and Recreation. Washington: American Association for Health, Physical Education and Recreation, 1959.
- Scott, Gladys M. and Esther French. Measurement and Evaluation in Physical Education. Dubuque, Iowa: W. M. C. Brown Company Publishers, 1959.

Smith, Milton G. A Simplified Guide to Statistics for Psychology and Education. New York: Holt, Rinehart and Winston, 1962.

Vannier, Maryhelen, and Hally Beth Poindexter. Individual and Team Sports for Girls and Women. Philadelphia and London: W. B. Saunders Company, 1960.

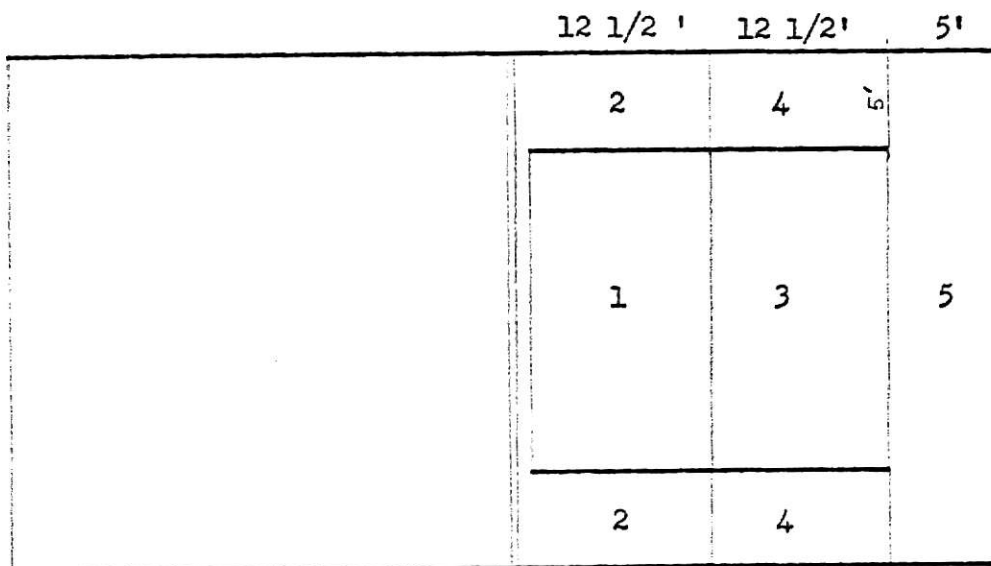
APPENDIXES

APPENDIX A

DESCRIPTION OF THE RUSSELL LANGE VOLLEYBALL SERVE TEST

1. A court with special markings, as shown below, was prepared. The marked areas were chalked numbers indicating the score value of the respective areas.
2. The subjects being tested stood behind the end line in the serving area and were given ten serves to place the ball into the targets across the net. Any legal service was permitted and a "let" ball was served over.
3. The score was the point value of the spot on which the served ball landed. A ball that landed on a line was scored the higher value of the two areas. Serves in which foot faults occurred were scored zero. Two trials of ten serves each were given and the sum of the scores in the areas for the best trial was recorded.

Net



APPENDIX B

SCORECARDS USED IN VOLLEYBALL TESTS

Serve Scorecard

Name											Date	
	1	2	3	4	5	6	7	8	9	10	Total	
1st												
2nd												

Volley Scorecard

Name			
1st		2nd	
1.		1.	
2.		2.	
3.		3.	
Total		Total	

APPENDIX C

DESCRIPTION OF THE RUSSELL LANGE REPEATED VOLLEYING TEST

1. A line ten feet long was marked on the wall at net height, seven and one-half feet above the floor; another line, ten feet long, was marked on the floor, parallel to and three feet from the wall.
2. The subjects being tested stood behind the three foot line, and with an underhand movement tossed the ball to the wall above the net line for thirty seconds. The ball was set up as many times as desired or necessary. If the ball got out of control, it had to be recovered by the subject and brought back to the three foot line to be started over again as at the beginning.
3. The score was the number of times the ball was clearly batted (not tossed) from behind the three foot line to, on, or above the seven and one-half foot line on the wall. The total score from the best of three trials was recorded.

APPENDIX D

DESCRIPTION OF THE SCOTT-FRENCH SOFTBALL REPEATED THROW TEST

1. A line was drawn on the wall seven and one-half feet from the floor; another line, fifteen feet from the wall and parallel to it.
2. The subject being tested stood any place behind the restraining line and facing the wall. On the signal, Ready, Go! the subject threw the ball against the wall so that it hit above the seven and one-half foot line, caught it, and repeated this as many times as she could in thirty seconds. One ball was used throughout the test; if it got out of control, it had to be recovered by the subject being tested. (The loss of time was considered sufficient penalty.) Foot faults (stepping on or over the line) were watched by the assistant and the subject was told to move back. Any throws made while the subject was on or over the line did not count.
3. One point was counted each time the ball hit on or above the seven and one-half foot line, providing the throw was made when the subject was behind the restraining line. The score for the entire test was the total of six trials of thirty seconds each.

APPENDIX E

SCORECARDS FOR SOFTBALL AND FIELD HOCKEY TESTS

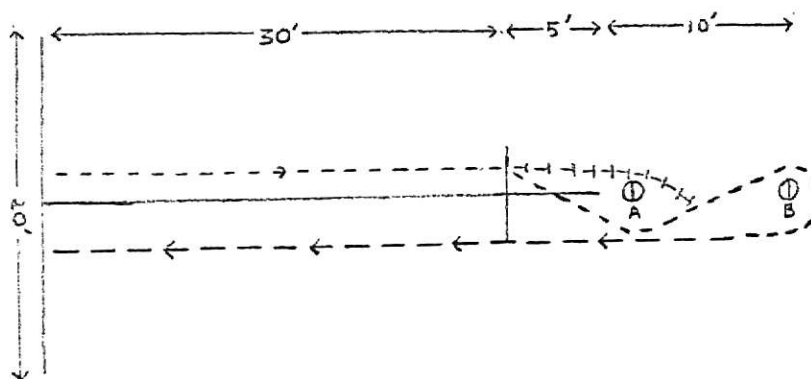
SOFTBALL	
Name _____	
1st	2nd
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____
6. _____	6. _____
Total	Total

FIELD HOCKEY	
Name _____	
1st	2nd
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____
6. _____	6. _____
Total	Total
Avg.	Avg.

APPENDIX F

DESCRIPTION OF THE SCOTT AND FRENCH FIELD HOCKEY TEST

1. The subject being tested stood behind the starting line with the hockey ball placed on the starting line at any point to the left of the foul line. On the signal, Ready, Go! the subject dribbled the ball forward to the left of and parallel to the foul line. As soon as the restraining line was reached, the ball was sent from the left side of the foul line to the right of the first obstacle (from the subject's point of view), and the subject ran around the left side of the obstacle and recovered the ball. Next, the subject executed a turn toward her right around the second obstacle and recovered the ball. As soon as possible after that the ball was driven toward the starting line. If the drive was not hard enough to reach the starting line, the subject had to follow it up and hit the ball again. This procedure was repeated until six trials had been given. The subjects were alternated on trials to avoid their becoming fatigued.
2. The score for one trial was the time it took from the signal Go! until the subject's ball had again crossed the starting line. The score for the entire test was the average of the six trials. It was considered a foul and the trial did not count if the ball or subject crossed the foul line before reaching the restraining line and in executing the dodge the ball was not sent from the left side of the foul line.



Field markings and action sequence for the field hockey ball control test.

- A, B = jump standards (obstacles)
- = dribble
- |-|- = path of player in dodge
- --- = drive

AN EVALUATION OF THE BASIC PHYSICAL EDUCATION COURSE
FOR WOMEN MAJORS AT KANSAS STATE UNIVERSITY

by

JUDY ANN AKERS

B. S., Kansas State University, 1967

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Physical Education

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1970

The primary purpose of this study was to determine if there was a significant difference of skill level between the first and second battery of tests in the major basic physical education course for women. The experiment used was on a group of 51 students, and the evaluating instrument was a battery of skill tests for volleyball serve, overhead volley, softball repeated throw, and field hockey ball control.

The subjects involved in the study were of essentially the same background. All were enrolled in a 10:30 A.M. required major basic physical education course for women at Kansas State University; they were from seventeen to twenty years of age.

The study covered one semester of thirty-three class periods with four days used for initial testing and the remainder for instruction, practice and retesting. The subjects were tested at the beginning of the fall semester and at the end of each activity. During the semester the subjects received instruction on each activity and practiced the skill tested on for 10 minutes of each class period up to the second testing.

The data obtained from this study showed that there was a significance at the .01 level between the first and second battery of tests. This made it impossible to accept the first hypothesis that there would not be a significant improvement between the first and second battery of tests. The hypothesis concerned with a definite significance between the first and second tests for those below the initial mean was shown by a significant difference at the .01 level. The group above the mean did not show a significance at the .10 level except for the field hockey testing which was significant at the .01 level.

The entire study centered around the establishment of an exemption level from data gathered. Concerning the last hypothesis it was felt that substantial support was provided to show that an exemption level could be established above the initial mean of these tests due to the fact that their level of significance was below .10 on three of the tests.