

February 21, 1938.

Coach W. H. Browne,
University of Nebraska,
Lincoln, Nebraska.

Dear Brownie:

Thank you for your letter of the 17th instant enclosing statistics on your basketball games. I wonder if we could have a little more complete information on the time consumed in bringing the ball across the division line after a goal has been scored. For instance, the number of trials by both teams, the total time required to bring the ball across, and then the average time. I am enclosing a form, which shows just what information we need.

I am glad you are interested in our radio programs, and we shall be glad to send you copies as the broadcasts are made each week.

With all good wishes, I am

Sincerely yours,

Director of Physical Education,
Varsity Basketball Coach.

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THE UNIVERSITY OF NEBRASKA
LINCOLN

Ackd

DEPARTMENT OF
INTERCOLLEGIATE ATHLETICS
OFFICE OF THE DIRECTOR

February 17, 1938

Dr. Forrest C. Allen
Director of Athletics
University of Kansas
Lawrence, Kans.

Dear Dr. Allen:

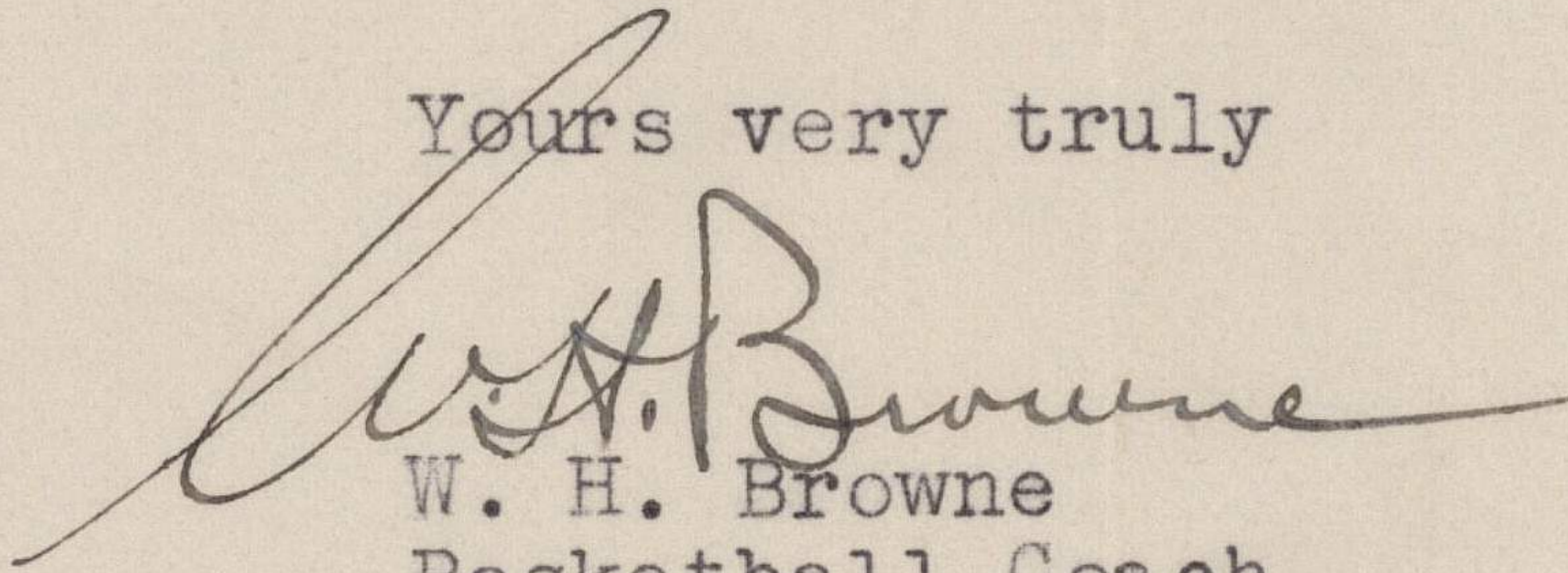
Enclosed is the information you asked for in your letter of February 14th. I hope it will aid you in compiling the statistics you desire. These figures were gathered by students and the accuracy is not vouched for but believe will serve the purpose.

Many thanks, Dr. Allen, for the copies of your radio program on physical education for health. I surely appreciated receiving these copies and have gotten many good ideas from their use. You have done a fine piece of work on this program and certainly deserve congratulations.

If extra copies are available on the remainder of the ~~program~~ I will appreciate them.

Your basketball team is getting stronger and I know will finish in a manner that will make you very proud.

Yours very truly


W. H. Browne
Basketball Coach

WHB:JS
Enc

Information on our home conference games,
 requested by Dr. Allen.

| Game | No. of held balls in free throw circles | No. of held balls in center circle | Total no. of held balls | Goals resulting from possession of ball after held ball | Time consumed in bringing ball past center line after field goal and foul goal | |
|--------------|---|--|----------------------------|--|--|----------------------|
| | | | | | Nebr. | Opponents |
| Kansas State | 22 | 1 | 23 | 4 | 1:04 | 1:51 |
| Missouri | 16 | 2 | 18 | 2 | 2:02 1:24 | 2:10 2:05 |
| Oklahoma | 28 | 1 | 29 | 4 | 2:02 | 2:10 |
| Iowa State | 11 | 3 | 14 | 2 | 1:00 | 2:37 |
| Total | 77 | 6 | 83 | 12 | | |

| Game | Time consumed in bringing ball across division line after goal. | | | Number of held balls | | | Total | Number of goals scored after jump ball. |
|------------------------------------|---|-------------------|---------------------|----------------------|---------------|------------|-------|---|
| | No. of Trials | Total time (sec.) | Average Time (sec.) | End Circle | Center Circle | End Circle | | |
| Kansas-Kansas State at Manhattan | 28 | 160 | 5.7 | 18 | 3 | 5 | 26 | 0 |
| Iowa State-Kansas State, at Ames | | | | 5 | 2 | 4 | 11 | 0 |
| Kansas State-Missouri at Manhattan | 29 | 197 | 6.8 | 11 | 4 | 17 | 32 | 0 |
| Kansas-Iowa State at Lawrence | 14 | 49.4 | 6.65 | 8 | 4 | 3 | 15 | 1 |
| Kansas-Oklahoma at Lawrence | 34 | 104.9 | 6.13 | 3 | 4 | 5 | 12 | 1 |

Kansas - Nebr
at Lincoln

~~32 146 4.59~~ 1 1 10 12 3
34 146 4.29



EXHIBIT A

| | Eval. pt + wts plus wts. | Corlis | Harp | Pralle | Reid | Florell | Golay | Ebling | Schmidt | Johnson | Durand | Hunt | Kappelman | Team Total |
|---|-----------------------------|--------|------|--------|------|---------|-------|--------|---------|---------|--------|------|-----------|------------|
| No. of player | | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 18 | 20 | 7 | | 15 | -- |
| No. of min. played | | 23 | 29.5 | 40 | 5 | 2.5 | 11.5 | 36 | 53.5 | 12.5 | 3 | .5 | 1 | |
| Total of Eval/ Pts | | 126 | 137 | 239 | 24 | 9 | 32 | 166 | 149 | 30 | 22 | 0 | 3 | 939 |
| Eval. pts per min. | | 5.5 | 4.6 | 5.9 | 4.8 | 3.6 | 2.8 | 4.6 | 4.3 | 2.4 | 7.3 | 0 | 3 | 4.68 |
| Goals attempted | | 6 | 4 | 18 | 1 | 2 | 2 | 8 | 8 | 2 | 0 | 0 | 0 | 51 |
| Goals made | | 4 | 2 | 6 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 17 |
| % of Goals made | | 66.7 | 50 | 33.3 | 0 | 0 | 0 | 37.5 | 25 | 0 | 0 | 0 | 0 | 33.3 |
| Free throws att. | | 1 | 1 | 5 | 1 | 1 | 0 | 8 | 1 | 0 | 0 | 0 | 0 | 18 |
| Free throws made | | 1 | 1 | 3 | 1 | 1 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 14 |
| % of Free throws | | 100 | 100 | 60 | 100 | 100 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 77 |
| Personal fouls | | 0 | 1 | 1 | 1 | 0 | 2 | 2 | 4 | 2 | 0 | 0 | 0 | 13 |
| Goal Eval. Pts | 10 | 40 | 20 | 60 | 0 | 0 | 0 | 30 | 20 | 0 | 0 | 0 | 0 | 170 |
| F.T. Eval. Pts | 5 | 5 | 5 | 15 | 5 | 5 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 70 |
| Immediate assists | 4 | 4 | 4 | 4 | 0 | 0 | 12 | 16 | 12 | 4 | 0 | 0 | 0 | 56 |
| Secondary assists | 3 | 0 | 9 | 5 | 0 | 0 | 0 | 3 | 15 | 0 | 0 | 0 | 0 | 33 |
| Ball off opponents backboard | 2 | 6 | 8 | 6 | 0 | 4 | 2 | 14 | 0 | 2 | 2 | 0 | 0 | 44 |
| Ball off own backboard | 2 | 8 | 2 | 2 | 0 | 0 | 4 | 8 | 4 | 0 | 6 | 0 | 0 | 34 |
| Taps & rec own ball | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Recovers own team- mates jump | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 3 | 1 | 0 | 0 | 1 | 8 |
| Good passes | 1 | 34 | 51 | 72 | 9 | 3 | 18 | 40 | 61 | 16 | 8 | 0 | 1 | 313 |
| Good Catches | 1 | 34 | 42 | 78 | 10 | 1 | 15 | 42 | 64 | 15 | 8 | 0 | 1 | 310 |
| Total No. possible Evaluation Points | | 131 | 142 | 243 | 24 | 13 | 52 | 139 | 179 | 38 | 24 | 0 | 3 | 1036 |
| Error of omission | | | | | | | | | | | | | | |
| Held ball obtained by opponent | -1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | 0 | 0 | 0 | 0 | -1 |
| Fumbles and goes out-of-bounds | -2 | -2 | 0 | 0 | 0 | 0 | 0 | -6 | 0 | 0 | -2 | 0 | 0 | -10 |
| Fumbles and ob- tained by opp. | -2 | 0 | 0 | -2 | 0 | 0 | 0 | -2 | -4 | 0 | 0 | 0 | 0 | -8 |
| Taps ball out-of-bounds | -2 | -2 | 0 | 0 | 0 | 0 | 0 | -2 | -2 | 0 | 0 | 0 | 0 | -6 |
| Wild pass out-of-bounds | -3 | 0 | 0 | 0 | 0 | 0 | -3 | 0 | -3 | 0 | 0 | 0 | 0 | -6 |
| Wild pass to opponents | -4 | 0 | 0 | 0 | 0 | -4 | -4 | -8 | -4 | 0 | 0 | 0 | 0 | -20 |
| Violation | 5 | 0 | -5 | 0 | 0 | 0 | -5 | -5 | -15 | 0 | 0 | 0 | 0 | -30 |
| Foul- Offensive Evaluation Pts. | -8 | 0 | 0 | 0 | 0 | 0 | -8 | 0 | 0 | -8 | 0 | 0 | 0 | -16 |
| Total Negative Evaluation Pts. | | -4 | -5 | -4 | 0 | -4 | -20 | -23 | -29 | -8 | -2 | 0 | 0 | -99 |

EXHIBIT B

86

| | Baker | Washburn | Morningside | South-western | Oklahoma | Iowa | Nebraska | Missouri | Kansas State | Season Total | | | | | | | |
|--------------------------------|-------|----------|-------------|---------------|----------|------|----------|----------|--------------|--------------|------|-----|------|-----|-------|------|-------|
| Min. played | 7.5 | 21 | 28.5 | 10 | 38.5 | 7 | 45.5 | 7 | 52.5 | 23 | 75.5 | 23 | 38.5 | 14 | 112.5 | 29.0 | 141.5 |
| T. Eval. Pt | 9 | 85 | 94 | 32 | 126 | 22 | 148 | 21 | 169 | 102 | 271 | 127 | 398 | 64 | 462 | 98 | 560 |
| Eval. Pt. per min | 1.2 | 3.5 | 2.7 | 3.2 | 2.8 | 1.6 | 2.9 | 3.0 | 2.9 | 4.5 | 3.3 | 5.3 | 3.8 | 4.6 | 4.1 | 3.4 | 3.96 |
| Goals attempted | 2 | 4 | 6 | 2 | 8 | 3 | 11 | 2 | 13 | 8 | 21 | 6 | 27 | 2 | 29 | 4 | 33 |
| Goals made | 0 | 2 | 2 | 2 | 4 | 0 | 4 | 0 | 4 | 1 | 5 | 4 | 9 | 1 | 10 | 0 | 10 |
| % of goals made | 0 | 50 | 33 | 100 | 50 | 0 | 36 | 0 | 30 | 17 | 24 | 67 | 33 | 50 | 34 | 0 | 30.3 |
| Free throws att. | 0 | 4 | 4 | 0 | 4 | 0 | 4 | 0 | 4 | 1 | 5 | 1 | 6 | 0 | 6 | 1 | 7 |
| Free throws made | 0 | 3 | 3 | 0 | 3 | 0 | 3 | 0 | 3 | 1 | 4 | 1 | 5 | 0 | 5 | 0 | 5 |
| % of free throws | 0 | 75 | 75 | 0 | 75 | 0 | 75 | 0 | 75 | 100 | 80 | 100 | 83 | 0 | 83 | 0 | 71.4 |
| Personal Fouls | 0 | 2 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 1 | 3 | 0 | 3 | 0 | 3 | 0 | 3 |
| Goal Eval. Pt. | 0 | 20 | 20 | 20 | 40 | 0 | 40 | 0 | 40 | 10 | 50 | 40 | 90 | 10 | 100 | 0 | 100 |
| Free throw Eval Pt. | 0 | 15 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 5 | 20 | 5 | 25 | 0 | 25 | 0 | 25 |
| Immediate Asst. | 0 | 16 | 16 | 0 | 16 | 0 | 16 | 0 | 16 | 8 | 28 | 4 | 28 | 4 | 32 | 12 | 44 |
| Secondary Asst. | 0 | 0 | 0 | 3 | 3 | 0 | 3 | 3 | 6 | 3 | 9 | 0 | 9 | 3 | 12 | 3 | 15 |
| Ball off opp. backboard | 0 | 2 | 2 | 0 | 2 | 0 | 2 | 2 | 4 | 2 | 6 | 6 | 12 | 6 | 18 | 4 | 22 |
| Ball off own backboard | 0 | 4 | 4 | 2 | 6 | 0 | 6 | 2 | 8 | 8 | 16 | 18 | 24 | 2 | 26 | 14 | 40 |
| Taps - recovers own ball | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 |
| Recovers teammate's jump | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 3 | 0 | 3 | 1 | 4 | 2 | 6 |
| Good passes | 4 | 17 | 21 | 9 | 30 | 9 | 39 | 13 | 52 | 35 | 87 | 34 | 121 | 19 | 140 | 44 | 184 |
| Good catches | 8 | 23 | 31 | 8 | 39 | 10 | 49 | 15 | 64 | 33 | 97 | 34 | 131 | 19 | 150 | 38 | 188 |
| T. No. Positive Eval. Pt. | 12 | 97 | 109 | 42 | 151 | 22 | 173 | 36 | 209 | 105 | 314 | 131 | 444 | 64 | 509 | 117 | 626 |
| Error of omission | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | -1 | 0 | -1 | 0 | -1 | 0 | -1 | 0 | -1 |
| Held ball obtained by opp. | 0 | -2 | -2 | 0 | -2 | 0 | -2 | -1 | -3 | 0 | -3 | 0 | -3 | 0 | -3 | -2 | -5 |
| Fumbles and goes out-of-bounds | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -2 | -2 | 0 | -2 | -2 | -4 | 0 | -4 | 0 | -4 |
| Fumbles and obtained by opp | 0 | -4 | -4 | 0 | -4 | 0 | -4 | 0 | -4 | 0 | -4 | 0 | -4 | 0 | -4 | -2 | -6 |
| Taps ball out-of-bounds | 0 | -2 | -2 | -2 | -4 | 0 | -4 | 0 | -4 | 0 | -4 | -2 | -6 | 0 | -6 | -2 | -8 |
| Wild passes out-of-bounds | -3 | 0 | -3 | -3 | -6 | 0 | -6 | -6 | -12 | -3 | -15 | 0 | -15 | 0 | -15 | 0 | -15 |
| Wild passes to opponents | 0 | -4 | -4 | 0 | -4 | 0 | -4 | 0 | -4 | 0 | -4 | 0 | -4 | 0 | -4 | 8 | |
| Violations | 0 | 0 | 0 | -5 | -5 | 0 | -5 | -5 | -10 | 0 | -10 | 0 | -10 | 0 | -10 | 5 | |
| Foul offensive Eval. Pt. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total negative Eval. Pt. | -3 | -12 | -15 | -10 | -25 | 0 | -25 | -15 | -40 | -3 | -43 | -4 | -43 | 0 | 47 | -19 | -66 |

EXHIBIT C

DIRECTIONS

Consider the following items of the player's offensive ability.

1. His scoring ability.
2. His ability to recover rebounds.
3. His ability to pass accurately.
4. His ability to receive the ball on passes.
5. His ability to recover jump balls.
6. His ability to avoid held balls.

After considering the above points, rate the players in the alphabetical list from 1 to 13. The player you consider best should be rated number 1, and the poorest should be numbered 13.

| Rating of "offensive" ability | NAMES |
|-------------------------------|-----------|
| _____ | Corlis |
| _____ | Durand |
| _____ | Ebling |
| _____ | Florell |
| _____ | Golay |
| _____ | Harp |
| _____ | Hunt |
| _____ | Johnson |
| _____ | Kappelman |
| _____ | Pralle |
| _____ | Reid |
| _____ | Schmidt |
| _____ | Sullivan |

EXHIBIT D

UNIVERSITY OF KANSAS
Lawrence

Department of Physical Education

May 10, 1938

TO THE BASKETBALL SQUAD:

In connection with the basketball research that we have been doing this winter we need your opinion. You have worked with your group of boys and know them better than an outsider, and hence your opinion is better than mine.

Each member of the Varsity and Freshman squad is being asked to rate a group of this year's Varsity players. Will you please read the directions on the enclosed sheet carefully, and in the seclusion of your room give us a careful opinion? If your name is in the list, give yourself an honest rating.

Please note that you are not being asked to sign these sheets and we have no method of identifying them. It is hoped that you will cooperate in this matter.

Very truly yours

V. W. Lapp

RATING BASKETBALL PLAYERS -
THEIR BATTING AND FIELDING
AVERAGES COMPUTED

PLAYING SEASONS OF 1937-38 and 1938-39

- - - - -
- - - - -
- - - - -
- - -
- -
-

Dr. Forrest C. Allen
Dr. E. R. Elbel
Dr. V. W. Lapp

Department of Physical Education, University of Kansas

EVALUATION STUDY FOR 1938-39 SEASON

Allen
Eckel
Lapp

In the 1938¹-39 study the evaluation technique has been extended to include a defensive rating system for both the team and the individual player. The items and their evaluation weights, as used in this study, are shown in Table I.

Data were collected during all the home games on both the Kansas team and the visiting teams. The technique used in the collection of these data is the same as described in the first evaluation study.

In the 1937-38 season nine home games were played, and this season eight home games were played, thus making a total of 17 games on which averages of certain activities were available. These averages are shown in Table III. The 17 game averages seem to be reliable as there was no great variation in the figures computed for the two seasons. The team this year took more shots than did last season's team, but averaged one less goal per game. The number of free throws awarded in both seasons was practically identical, but the number made was slightly reduced this season.

This year the total number of positive offensive evaluation points is lower than last year's total. This is due to two reasons. First, there was a change in the technique of tabulating immediate assists. In last year's study credit was given the players for both passes and catches, which gave them double credit in evaluation points. In this year's study a player receives evaluation points only once. The second reason for the lower total is that the recovery of rebounds off the opponent's backboard was computed with the defensive play instead of offensive play, as was the case in last year's study.

The drop in negative offensive evaluation points indicates that the team made fewer mistakes during this season than last season. It is possible that the team summary posted in the team dressing room the day following each game made the individual players more conscious of their mistakes with the end result that fewer were made.

The defensive evaluation points as shown in Table I do not accumulate as rapidly as do the offensive points. However, this is not true of the negative defensive points. During ^{the season} a ~~game~~ the negative defensive points were accumulated almost exactly twice as fast as were the negative offensive points. The penalty for fouling should be high because if a player committed a foul he immediately gave the opponents a chance to make 5 or 10 positive offensive points. In games where a player was forced out by fouls his total negative points exceeded his positive points.

The team summaries (see Table IV) were made from the data gathered during ^{the} last ^{home} season ~~at home~~. Kansas did not lose a home contest this season and lost only one last season. Because no data were available on the opposition at the time of the loss it is not possible to show the effect of losing a game on the statistics gathered. Due to its style of play, Kansas does more passing than most teams. This is well shown under total passes and catches, Table III. Even in a loss it is possible Kansas would show a higher evaluation point total due to the factor just mentioned. It would be interesting to collect data for games played away from home. However, this has been considered impractical to date.

Included in the team summary, Table III, a new term (defensive efficiency) is listed. This term is the result of the formula:

$$\frac{\text{total positive defensive evaluation points}}{\text{sum of positive and negative defensive points}}$$

Due to the ease with which negative defense points can be accumulated the efficiencies for defense are low. The composite efficiency, like last year's efficiency, is based on the net positive points and negative points that are earned during the entire game. The composite efficiency rating seems to parallel the game score more closely than some of the other items.

A close examination of the statistics of the game with Team D will lead one to wonder just how the Kansas team won the game. The story is told in goals made where the home team made two more than the opposition. The remaining statistics are largely in favor of Team D.

In the middle of the season there was some question about the number of violations. It seemed that the number of violations was too low and it was the opinion that our observers were missing a few violations. Without discussing the matter with the observers, a check was made during the game with Team F and both sets of observers had nine violations on the Kansas team charged against the same boys. We realize the data cannot be more accurate than our observers and this check on the violations indicate that our boys were noticing the game rather closely.

Table IV shows the player analysis for twelve players. A few more players were used in the home contests, but all had less than 20 minutes of playing time to their credit and were not included in the present table. The number (see Table IV) preceding the dash in the various columns represents the individual's rank in relation to the other members of the squad.

The scoring ability index as shown in column 2 is based upon goals and free throws made and is computed as shown in the first study under definition of terms. If two boys each made 25 goals, the one with the highest percentage of made shots will have the highest scoring ability index.

By changing the order of some of the data it is possible to make some player comparison between the two seasons play on the same basis.

| Player | 1937-38 season | | 1938-39 season | |
|--------|----------------------|---------------------|----------------------|---------------------|
| | Offensive efficiency | Ball handling error | Offensive efficiency | Ball handling error |
| A | 90.5 | 4.6% | 95.7 | 1.4% |
| B | 96.4 | 1.7 | 97.9 | .5 |
| F | 92.2 | 2.9 | 97.2 | 1.1 |
| I | 94.1 | 2.0 | 76.4 | 2.4 |
| L | 94.3 | 2.4 | 97.6 | 1.5 |

This rating shows that all the players, with the exception of Player I who did not finish the season, did make improvement.

The evaluation points per minute (see Table IV) earned during the playing season show how ~~busy~~ ^{active} the individual was, while the composite efficiency shows how well the individual performed his tasks.

The ~~opponent's~~ ^{of visiting teams} players, were rated on a few items ^{which} and these are shown in Table V. The table is limited to players who played at least 15 minutes during the game. The table (V) divides itself naturally into three groups:

- 1. Above 90% playing efficiency
- 2. Between 80% and 90% playing efficiency
- 3. Below 80% playing efficiency.

The group above 90% consisted of 13 players, the two highest ^{in this group} of whom were forwards, three centers and eight guards, ^{composed the remainder of the list}. The next group consisted of 22 players, four of whom were centers, seven were guards, and eleven were forwards. The group below 80% contained 11 players, three centers, four forwards and four guards.

It should be pointed out that out of the high eight players from the standpoint of playing efficiency, four of these players belong to School D, and that the players ranked one and two in evaluation points earned per minute also ^{were also from the same team} belonged to School D. Also, it should be noted that two players of school D were ranked among those that were listed with zero ball handling errors.

On the basis of the data presented in Table V ^{it would be interesting} one could ~~pick~~ ^{to select} an all-opposition team ~~that would be hard to beat.~~

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Summary & Conclusion

To a great extent

Realizing this

Research of this type depends upon the accuracy of the observers. Because this was realized, the observers were very carefully selected from student majors and other interested students. The same was done in all the games and ~~the~~ ^{there is every} reason to believe that the results are very nearly correct.

It is the opinion of the writer, ~~that~~ ^{the} study has merit because:

1. It points out mistakes made during a game and ~~makes~~ ^{stresses} the players' courses of ~~them~~ ^{to be more} fundamental.
2. It ~~points out~~ ^{stresses} the importance of ~~fundamental~~ ^{game}.
3. It ~~provides~~ ^{provides} an itemized history of the contest.
4. It ~~makes~~ ^{provides} a more accurate means of comparing individual and teams.

Ames

over

1938-39

In ~~this year's~~ study the evaluation technique has been extended to include a defensive rating system for both the team and the individual player. The items and their evaluation weights, as used in this study, are shown in Table I.

Data were collected during all the home games on both the Kansas team and the visiting team.^S The technique used in the collection of these data is the same as described in the first evaluation study.

In the 1937-38 season nine home games were played and this season eight home games were played, thus making a total of 17 games on which averages of certain activities were available. These averages are shown in Table II. The 17 game averages seem to be reliable as there was no great variation in the figures computed for the two seasons. The team this year took more shots than did last season's team, but averaged one less goal per game. The number of free throws awarded in both seasons was practically identical, but the number made ^{was} ~~took~~ *slightly reduced this season* a slight slump.

~~When one observes the~~ total number of offensive evaluation points, ~~he notices that this year's total is lower.~~ *than last year's total.* This is due to a change in the technique of tabulating immediate and secondary assists. In last year's study credit was given ~~for them~~ ^{the players for} also as passes and catches, which gave the ~~player~~ double credit in evaluation points. In this year's study a player received evaluation points only once. Another reason for the lower total in positive offensive evaluation points is that the recovery of rebounds off the opponent's backboard was computed with the defensive play instead of offensive play as in last year's study.

The drop in negative offensive evaluation points indicates that the team made fewer mistakes during this season than last season. It is possible that the team summary posted in the team dressing room the day following each game made the individual player more conscious of his mistakes with the end result that fewer mistakes were made.

The defensive evaluation points as shown in Table I do not accumulate as rapidly as do the offensive points. However, this is not true of the negative defensive points. During a game the negative defensive points ^{were accumulated} ~~count~~ up almost exactly twice as fast as ^{were} ~~did~~ the negative offensive points. ^{because} If a person committed a foul he immediately ~~gives~~ the opponents a chance to make 5 or 10 positive offensive points, and the penalty for fouling should be high. In games where a player was forced out by fouls his total negative points exceeded his positive points.

The team summaries (see Table IV) were made from the data gathered during last season at home. Kansas did not lose a home contest this season and lost only one last season. Because no data ^{were} was available on the opposition at the time of the loss it is not possible to show the effect of losing a game on the statistics gathered. Due to its style of play, Kansas does more passing than most teams. This is well shown under total passes and catches, Table III. Even in a loss it is possible Kansas would show a higher evaluation point total due to the factor just mentioned. It would be interesting to ^{collect data even for games} follow a team on the road to gather similar data as herein presented. However, ^{this has been} until more funds are ^{considered impractical to date} available it is impractical to carry 12-14 men extra for research purposes.

^{Included in} Under the team summary, Table III, a new term (defensive efficiency) ^{is listed} appears. This term is the result of the formula:

$$\frac{\text{total positive defensive evaluation points}}{\text{Sum of positive and negative defensive points}}$$

Due to the ease with which ^{one} ~~one~~ ^{can} ~~can~~ ^{be} accumulate negative defense points the efficiencies for defense are low. The composite efficiency ^{seems} to parallel the game score more closely than some of the other items. The composite efficiency, like last year's efficiency, is based on the net positive points and negative points that are earned during the entire game.

A close examination of the statistics of the game with Team D will lead one to wonder just how the Kansas team won the game. The story is told in

goals made where the home team made two more than the opposition. The remain-
ing statistics ^{are largely in favor of} ~~point largely to~~ Team D.

In the middle of the season there was some question about the number of violations. It seemed that the number of violations was too low and it seemed to

be the opinion that our observers were missing³
a few violations. Without discussing the matter
with the observers, a check was made during the
game^{with Team} ~~1~~ ^F and both sets of observers ~~also~~ had nine
violations on the Kansas team charged against the
same boys. We realize the data can^{not} be ^{more} ^{SP} accurate
~~only as the~~ than our observers and this check on
the violations indicate that our boys were ~~checking~~
^{SP} noticing the game rather closely.

Table IV shows the player analysis^{for} ~~twelve~~
~~based on the list~~
players ~~as listed~~. A few more players were used in
the home contests but all had less than 20 minutes
of playing time to their credit and ~~are~~ ^{were} not included
in the present table. The number (see table IV) preceding
the dash in the various columns represents the individual's
rank in relation to the other members of the squad. The
scoring^{ability} index ~~shown~~ as shown in column
2 is based upon goals made and free throws made and
is computed as shown in the first study under definition
of terms. If two boys each made 25 goals, the one
with the highest percentage of made shots will have
the highest scoring ability index.

By changing ^{records of} some of the data ~~at a little to put~~
 it in the same terms as that of last year, it is
 possible to make some player comparisons between
 the two years seasons play on the same basis:

| Player | 1937-38 season | | 1938-39 season | |
|--------|-------------------|---------------|-------------------|---------------|
| | eff. | Ball H per | eff. | Ball H per |
| A | 90.5 | 4.670 | 95.7 | 1.4 |
| B | 96.4 | 1.770 | 97.9 | .570 |
| F | 92.2 | 2.970 | 97.2 | 1.170 |
| L. | 94.1 | 2.070 | 76.4 | 2.470 |
| L. | 94.3 | 2.470 | 97.6 | 1.570 |

This rating shows that ^{all} the players ^{with the exception} did ^{who}
 make improvement in all cases except ~~that player~~
~~A. This player due to unusual conditions did~~
 not finish the season.

The evaluation points per minute earned
 during the playing ~~of~~ season shows how busy
 the individual was, while the comparative
 efficiency shows how well the individual
 performed his tasks. For example player L earned
 7.1 evaluation points per minute for 21.5 minutes of
 playing time but the player was under 90% efficient

The opponents players were rated on a few items and these are shown in table V. The table is limited to players who played at least fifteen minutes during the game. It is not a fair comparison to place the ~~the~~ Kaura players in the

the table. It divides itself naturally into three groups: ~~1. those with a playing efficiency above 90%, (2) those with~~

1. above 90% playing efficiency
2. between 80% and 90% playing efficiency
3. below 80% playing efficiency.

The group above 90% consisted of ^{thirteen} 13 players, the two highest of whom were forwards; ~~there were 3~~ ^{were} three centers and eight guards ~~in the group~~. The next group consisted of 22 players; four of whom were ^{eleven} centers, seven ~~players~~ were guards and 11 ~~players~~ were forwards. The group below 80% contained eleven players: three centers, four forwards and ~~four~~ ^{four} guards.

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It should be pointed out that out of the high eight ^{players} from the standpoint of playing efficiency four of these players belong to school D. and that the players ranked one and two in evaluation points scored per minute also belonged to school D. Also it

should be noted that two players of school 2 were ranked among those that were listed with zero ball handling errors.

Summary & conclusions

In the short time since the close of the season, it has been impossible to present and analyze all the data gathered during the last season.

~~Some of the data~~

However

On the basis of the data presented in table IV one could pick an all opposition team that would be hard to beat.

3
2
1

PLAYER ANALYSIS

| Player * | Position | * Minutes played | Scoring ability Index | Points scored | Points per game | Games played | Ball handling error | Playing efficiencies | | | Eval. points per minute |
|----------|----------|---------------------|-----------------------------|------------------|-----------------|--------------|------------------------|----------------------|-----------|-----------|----------------------------|
| | | | | | | | | Offensive | Defensive | Composite | |
| A | g | 1-276 | 2-857 | 2-54 | 6.8 | 8 | 5-1.4% | 6-95.4% | 2-80.8% | 2-92.9% | 3-6 |
| B | g | 2-227 | 4-503 | 5-27 | 3.4 | 8 | 2-0.5 | 3-97.8 | 3-73.4 | 3-92.4 | 5-5.6 |
| C | c | 3-226.5 | 7-331 | 4-31 | 3.9 | 8 | 1-0.3 | 3-97.8 | 9-41.1 | 6-90.4 | 2-6.3 |
| D | f | 4-187.5 | 1-1383 | 1-73 | 9.1 | 8 | 7-1.8 | 9-93.4 | 4-73. | 5-90.6 | 6-5.5 |
| E | f | 5-150 | 3-759 | 3-47 | 7.8 | 6 | 9-1.9 | 8-94.3 | 10-37.2 | 9-83.4 | 9-4.5 |
| F | f | 6-140.5 | 6-386 | 6-26 | 3.3 | 8 | 4-1.1 | 3-97.8 | 8-54.1 | 4-90.9 | 7 $\frac{1}{2}$ -4.9 |
| G | g | 7-105 | 8-268 | 9-15 | 2.5 | 6 | 11-2.9 | 7-94.6 | 5-67.3 | 8-88.5 | 7 $\frac{1}{2}$ -4.9 |
| H | c,f | 8-91.5 | 5-426 | 7-20 | 2.9 | 7 | 3-0.9 | 1-99.0 | 1-82.4 | 1-96.4 | 4-5.9 |
| I | f | 9-67.5 | 9-207 | 8-17 | 4.3 | 4 | 9-2.4 | 10-90.8 | 11-29.2 | 10-74.6 | 10-3.1 |
| J | g | 10-48.5 | 10-81 | 10-6 | 1.5 | 4 | 10-2.6 | 11-89.6 | 12-26.2 | 11-74.1 | 11-2.6 |
| K | f | 11-33.5 | 12-7 | 11-2 | .4 | 5 | 12-9.2 | 12-79.4 | 6-57.9 | 12-73.6 | 12-2 |
| L | c | 12-21.5 | 11-25 | 12-2 | .5 | 4 | 6-1.5 | 5-97.5 | 7-55.6 | 7-89.7 | 1-7.1 |

*Player rank in squad.

**This includes the players who had a playing time of more than 12 minutes on the home court.

PLAYER ANALYSIS

| Player ** | Position | * Minutes played | Scoring ability Index | Points scored | Points per game | Games played | Ball handling error | Playing efficiencies | | | Eval. points per minute |
|-----------|----------|------------------|-----------------------|---------------|-----------------|--------------|---------------------|----------------------|-----------|-----------|-------------------------|
| | | | | | | | | Offensive | Defensive | Composite | |
| A | g | 1-276 | 2-857 | 2-54 | 6.8 | 8 | 5-1.4% | 6-95.4% | 2-80.8% | 2-92.9% | 3-6 |
| B | g | 2-227 | 4-503 | 5-27 | 3.4 | 8 | 2-0.5 | 3-97.8 | 3-73.4 | 3-92.4 | 5-5.6 |
| C | c | 3-226.5 | 7-331 | 4-31 | 3.9 | 8 | 1-0.3 | 3-97.8 | 9-41.1 | 6-90.4 | 2-6.3 |
| D | f | 4-187.5 | 1-1383 | 1-73 | 9.1 | 8 | 7-1.8 | 9-93.4 | 4-73. | 5-90.6 | 6-5.5 |
| E | f | 5-150 | 3-759 | 3-47 | 7.8 | 6 | 9-1.9 | 8-94.3 | 10-37.2 | 9-83.4 | 9-4.5 |
| F | f | 6-140.5 | 6-386 | 6-26 | 3.3 | 8 | 4-1.1 | 3-97.8 | 8-54.1 | 4-90.9 | 7 $\frac{1}{2}$ -4.9 |
| G | g | 7-105 | 8-268 | 9-15 | 2.5 | 6 | 11-2.9 | 7-94.6 | 5-67.3 | 8-88.5 | 7 $\frac{1}{2}$ -4.9 |
| H | c,f | 8-91.5 | 5-426 | 7-20 | 2.9 | 7 | 3-0.9 | 1-99.0 | 1-82.4 | 1-96.4 | 4-5.9 |
| I | f | 9-67.5 | 9-207 | 8-17 | 4.3 | 4 | 9-2.4 | 10-90.8 | 11-29.2 | 10-74.6 | 10-3.1 |
| J | g | 10-48.5 | 10-81 | 10-6 | 1.5 | 4 | 10-2.6 | 11-89.6 | 12-26.2 | 11-74.1 | 11-2.6 |
| K | f | 11-33.5 | 12-7 | 11-2 | .4 | 5 | 12-9.2 | 12-79.4 | 6-57.9 | 12-73.6 | 12-2 |
| L | c | 12-21.5 | 11-25 | 12-2 | .5 | 4 | 6-1.5 | 5-97.5 | 7-55.6 | 7-89.7 | 1-7.1 |

*Player rank in squad.

**This includes the players who had a playing time of more than 12 minutes on the home court.

x

RESEARCHES IN BASKETBALL

Department of Physical Education, University of Kansas
Lawrence, Kansas

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BIG SIX CONFERENCE RESEARCH

With the elimination of the center jump the desire was to ascertain certain facts concerning the so-called fast break that the new rules might encourage.

The Big Six Conference coaches agreed in a pre-season committee meeting to gather and send in certain facts from all of their conference contests.

All held balls or jump balls were tossed up at the nearest 6-foot circle. The possibility of scoring from this position was considered an important finding.

Thirty Conference games were played. There is complete data from 18 games, incomplete data from 6 games, and no data was received from 6 games.

Three schools were especially diligent in sending statistics following each game, while the other three schools sent partial but not complete data on some of their games.

Some rather interesting findings were revealed in that for Big Six Conference play the average time for each individual movement across the division line was 4.37 seconds. The number of held balls during an entire game in our conference was ascertained, and lastly the possibility of scoring field goals after the toss-up, when the held ball was brought to the circle, was also determined.

The study is summarized as follows:

1. Length of time consumed in bringing the ball across the division line after a goal or free throw had been made; complete information from 18 games shows that:
 - (a) the act was performed 586 times for an average of 31.4 times per game
 - (b) a total time of 2527.1 seconds was used for an average of 140.4 seconds per game, or 2 min. 34 sec.
 - (c) the average time for each individual movement across the line was 4.37 seconds.
2. Number and location of held balls during games; complete information from 24 games shows that:
 - (a) held balls occurred 220 times in one end circle for an average of 9.1 per game;

Big Six Conference - cont.

(b) held balls occurred in the opposite end circle 163 times for an average of 6.8 per game;

(c) held balls occurred 52 times in the center circle for an average of 2.2 per game;

(d) held balls occurred for a total of 435 times for an average of 18.1 times during each game.

3. Number of goals made by the team securing possession of a jump ball before control of it was lost to the opposition; complete information from 24 games shows that:

(a) goals were made 32 times for an average of 1.33 per game.

Lawrence, Kansas

January 4, 1939.

Mr. H. V. Porter,
11 So. LaSalle Street,
Chicago, Illinois.

Dear Mr. Porter:

I haven't heard from you regarding the ladies' fan backboard. How is your experiment progressing? I shall be glad to hear from you.

I will also be glad to know what you think of the suggestion I have made in the enclosed letter which I am sending out to all members of the Research Committee in regard to painting white spaces on the black lines marking the basketball court.

With best wishes for a happy and prosperous New Year, I am

Sincerely yours,

FCA:AH

Chairman, Research Committee.