



*National Association
of
Basketball Coaches Convention
Tampa, Florida
March 1999*

1998-99
Research Committee Report
Tampa, Florida
March 1999

I. 1998-99 OBJECTIVES

A. Encourage basketball research.

1. Administer the NABC research grant program.

STATUS: The committee annually solicits, screens, recommends to the Board of Directors and monitors completion of basketball research grants (ten possible awards/up to \$1,000 per grant)

The present summary:

- a) Awarded/completed/funded _____ 26
- b) Awarded/in-progress _____ 7
- c) applications pending _____ 0

2. Publish basketball research in the NABC Courtside.

STATUS: Research articles/reports/grant abstracts are edited and submitted for publication.

3. Conduct cooperative rules experimentation with the NCAA Basketball Rules Committees.

STATUS: Focus continues on the evaluation of basketball equipment with priorities to protect players, improve performance, and maintain the quality and integrity of the game.

Efforts are still being placed on the problem of rebound/shooting differences attributed to inconsistencies in rim/backboard/support systems from court to court and especially between both baskets on the same court.

The rim testing process and parameters that were developed are still recommended, though not required, for college basketball. The NCAA Rules Committees have adopted acceptable energy absorption ranges from 35% to 50% for each basket and a maximum difference of 5% between baskets on the same court to keep the game the same on every court. In 1998-99 the committee revised the recommendation to preseason and pre-tourney testing so every competition gym would at least be tested before each season.

Recent findings confirm a relationship between energy absorption values and field goal shooting percentages as well as rebound differences. Increased incidents of variability of rim/backboard/support systems also are evident due to adjustability of rims and existing differences between approved equipment from many manufacturers. The NBA has also chosen to adopt standards in the 20% - 25% range (very tight and elastic).

It is still concluded that this problem threatens the fair play concept in basketball; i.e., rim & backboard equipment differences are influencing game outcome and the extent of the problem is increasing.

Mandatory rim testing would solve this problem and insure that all baskets are at the same height and have similar ball-rim rebound to *make the game the same everywhere*. The technology is there based on solid research done over a twelve-year period. Equipment adjustments/changes can be made to bring present equipment/systems into compliance.

4. Continue basketball equipment improvement/testing.

STATUS: In 1993-95, the U.S. Military Academy Engineering Departments centered on ball-rim and ball-floor interaction plus the development of an engineering model to evaluate the effect of additions/changes in equipment for basketball.

During 1995-97 experiments have been conducted to determine possible elasticity **changes** on breakaway rims that affect rebound and shooting percentages. The variability problems continue to grow.

In 1997-98, a preliminary pilot study was begun to examine the extent of variability on ball-floor interactions. During 1997-1998 rim testing was carried out successfully in the Southeastern Conference, the NCAA I tournament (including the Final Four) and at the NAIA I tourney in Tulsa at the Mabee Center.

In 1998-99 rim testing was required at all sites for the NCAA I and the NAIA I tournaments as well as in the Missouri Valley Conference.

B. Compile and maintain a bibliographic reference source of all basketball-printed materials in the United States.

STATUS: Updating was carried out in 1993-94. Revision of the *Basketball Resource Guide (Second Edition)* published by Human Kinetics Publishers, Champaign, Illinois was completed in 1995-96 for publication of the third edition in 1997 (five year publishing intervals). This edition is in computer disc format and is available from Human Kinetics (800-747-4457)

C. Communicate basketball rules and equipment information to NABC members.

1. Via the NABC Courtside

STATUS: It is recommended that the following schedule be adopted:

- a) Summer
Current year questionnaire results/new rules changes/comments on rules/NABC research grant guidelines.
 - b) Fall
Rules changes/points of emphasis/NABC research grant guidelines
 - c) Winter
Rules editor comments/grant guidelines
 - d) Spring
Last year's questionnaire results/rules issues article
 - e) Periodic articles on rules and research
2. Via the NCAA Men's Basketball Rules Committee
- STATUS: The NABC Research Committee Chair has attended rules committee meetings as an official representative of the NABC to the rules committee (since 1982). The research chairman was an ex-officio attendee to the meetings and was excluded from voting sessions of the committee. The NABC Board has sent the chair to the rules meetings for 1998 after a 1997 hiatus and the liaison role is to continue in 1999.
- D. Conduct the annual 30-year statistical trend analysis and questionnaire summary for presentation at the annual convention.

STATUS: For the seventh year in a row, the NCAA Statistics Service is furnishing only mid-season statistics for this trend analysis. The NCAA Rules - Editor will report on the questionnaire results.

II. STATISTICAL ANALYSIS

Based upon 1996-97 NCAA Division 1 statistics (mid-season statistics compared to previous 20 years).

A. Field Goals

1. Total FG

Constant

- a) Attempts – 57.3 per team

This is far under the all-time high of 70.3 (1951-52) and other near-highs in the early seventies. Since the 3 FG rule began in 1987, it is slightly lower than last year's figure.

Decrease

- b) Percentage – 43.7

Again this statistic shows a steady decrease since the 1984 high of 48.1 and is probably a reflection of the 3 point FG attempts general increase since the 1987 rules adoption.

2. Two Point FG

Decrease

- a) Attempts – 40.3

From the high of 47.9 in 1987, this statistic has shown a steady decrease to an all-time low due to the rise in popularity of the “trey.”

Decrease

- b) Percentage – 47.9

A fairly steady decrease of the past six years, this figure is lower than the all time high of 49.4 in 1989.

3. Three Point FG

Increase

- a) Attempts – 17.2

This figure is slightly down from an all-time high in 1998 (for the previous twelve consecutive years.)

Decrease

- b) Percentage – 34.2

Again, 3 FG % *continues to go down* (up this year) and 3 FG attempts proceeds generally upward, since the rules inception 12 years ago.

c) Trend Comparison - 3 point FG

YEAR	MADE	ATTEMPTS	3 POINT %	% TOTAL FG ATTEMPTS
1987	3.5	9.2	*38.4	15.4
1988	4.0	10.4	38.2	18.0
1989	4.4	11.8	37.8	20.0
1990	4.7	12.8	36.8	21.5
1991	5.0	13.8	36.2	22.7
1992	5.0	14.0	35.6	24.8
1993	5.3	14.9	35.4	24.8
1994	5.7	16.5	34.5	26.9
1995	5.9	17.2	34.5	28.4
1996	5.9	17.1	34.3	29.6
1997	5.8	17.1	34.1	29.8
1998	*6.0	*17.4	34.4	*30.2
MID 1999	5.9	17.2	34.2	30.0

* All time high

Increase

Percentage of total shots (30.2). This is a continuing trend; the 1987 ratio of 3 points FG/2 point FG being 2:10 compared to the 1999 figure of over 4:10. Another way of stating this finding is that the 3 point FG attempts per game average is 17.2 compared to 2 point FG attempts of 40.3. 3-point FG attempts make up **30%** of total shots compared to about **70%** of total shots for 2 point FG attempts. In today's game almost **1 in every 3** FG shots is a "trey" as opposed to 1 in 6 when the shot was first introduced in 1987.

Decrease

4. Overall FG% (43.7) is the second lowest in 33 years (43.1% in 1965). It seems clear that *shot quality* continues to drop since 1989 when the 3 FG was adopted.

B. Free Throws

Constant

1. Attempts – 21.7

This statistic shows a slight rise since 1973 but remains below the 1953 high of 32.9 as it plateaus the past three years.

Decrease

2. Percentage – 67.1

This figure, lower than the last three years' 67.4/67.4/67.5, is a slight departure from the 37-year constant trend in the 67-70 percent range.

Constant

3. Trend comparison - FT

YEAR	% TOTAL POINTS SCORED BY FT	% TOTAL SHOTS TAKEN BY FT
1950	20.5	27.6
1951	20.7	27.4
1952	21.4	27.2
1953	20.6	27.8
1954	20.9	27.8
1955	20.6	27.5
1956	20.7	27.6
1957	20.4	27.2
1958	20.6	27.5
MID 1999	20.5	27.5

Free throw importance seems to be decreasing (about 20% of total scoring and 27% of total shots as compared to all-time highs of 22.5% and 28.0%, respectively.) This is also a reflection of the growing importance of the 3 FG.

Constant

C. Personal Fouls

No mid-season report. For 1997, it was 19.3. This statistic has stayed between 19-21 for the past 30 years.

Constant

D. Total Points Scored – 70.5

Scoring is level as a trend. It is slightly above the “pre-three” figure of about 69 points but much less than the 1971 all-time high of 77.7.

E. Value of Ball Possession

The scoring probabilities in different situations are:

Constant

1. Field Goal

- a) Two point FG situation (.96)
- b) Three point FG situation (1.06)

Decrease

2. Free Throw

- a) One shot (.67)
- b) Bonus (1.06)
- c) Two shots (1.32)
- d) Three shots (1.98)

SUMMARY ORDER OF IMPORTANCE	
1 Shot FT	= .67
2 Point FG	= .96
3 Point FG	= 1.06
Bonus FT	= 1.06
2 Shot FT	= 1.32
3 Shot FT	= 1.98

There is a clear trend toward lowered shot quality, i.e., shooting percentages remain down in all areas even though leveling off this year at these lows.

DIVISION I MEN'S STATISTICAL TRENDS

SEASON	TEAMS	GAMES	FG MADE	FG ATT.	%	FT MADE	FT ATT	%	PF	PTS
1968	189	2700	29.1	66.6	43.7	17.4	25.1	69.1	19.0	75.5
1969	193	2779	29.1	66.4	43.8	17.4	25.4	68.4	19.0	75.6
1970	196	2833	30.0	67.8	44.2	*17.7	*25.7	68.7	19.3	77.6
1971	203	2971	30.1	67.8	44.4	17.5	*25.7	68.1	19.3	*77.7
1972	210	3070	30.1	67.2	44.8	17.5	25.6	68.6	19.2	*77.7
1973	216	3161	31.2	*69.6	44.8	13.1	19.2	68.4	19.2	75.5
1974	233	3426	31.0	68.3	45.4	12.8	18.7	68.4	19.2	74.8
1975	235	3461	*31.5	68.4	46.0	13.7	19.9	69.0	20.2	76.6
1976	235	3495	31.0	66.3	46.7	13.8	19.9	69.2	20.2	75.7
1977	245	3716	30.4	64.9	46.7	14.2	20.5	69.4	20.1	74.9
1978	254	3816	30.1	63.6	47.3	14.3	20.7	69.2	20.2	74.5
1979	257	3921	29.6	62.1	47.7	14.8	21.1	*69.7	*20.6	74.0
1980	261	4000	28.6	59.7	47.9	14.9	21.3	69.6	20.2	72.0
1981	264	4041	27.8	58.0	48.0	14.5	21.0	68.9	20.1	70.1
1982	273	4158	26.7	55.6	47.9	14.3	20.8	68.6	19.4	67.6
1983	274	4300	27.2	57.0	47.7	14.5	21.2	68.5	19.9	69.3
1984	276	4324	26.7	55.6	*48.1	14.8	21.4	68.9	20.0	68.2
1985	282	4436	27.3	57.0	47.9	14.7	21.3	68.9	19.7	69.2
1986	283	4468	27.4	57.3	47.7	14.7	21.3	69.1	19.6	69.4

*All-time high

NOTE: Averages and percentages are for both teams, per game.

SEASON	TEAM	GAMES	FG MADE	FG ATT	%	3 FT MADE	3FT ATT	%	FT MADE	FT ATT	%	PF	PTS
1987	290	*4570	27.2	58.7	46.4	3.5	9.2	*38.4	14.9	21.5	69.1	19.7	72.8
1988	290	4539	27.6	58.4	47.3	4.0	10.4	38.3	15.2	22.0	68.9	19.7	74.4
1989	293	4547	28.1	59.4	47.3	4.4	11.8	37.8	15.6	22.6	69.1	20.1	76.2
1990	292	4506	27.5	59.5	46.2	4.7	12.8	36.8	15.6	22.6	68.9	19.8	75.3
1991	295	4503	27.9	60.6	46.1	5.0	13.8	36.2	15.9	23.2	68.6	19.6	76.7
1992	298	4581	26.7	58.4	45.7	5.0	14.0	35.6	15.9	23.3	68.1	20.0	74.2
1993	298	4451	26.5	58.6	45.2	5.3	14.9	35.4	15.4	22.8	67.7	19.6	73.6
1994	301	4475	26.8	60.6	44.3	5.7	16.5	34.5	15.6	23.2	67.1	19.9	75.0
1995	302	4490	26.5	59.7	44.4	5.9	17.2	34.5	15.3	22.6	67.6	19.7	74.2
1996	305	4527	25.8	58.5	44.1	5.9	17.1	34.3	15.1	22.4	67.4	19.4	72.5
1997	305	4570	25.0	57.3	43.7	5.8	17.1	34.1	14.8	21.9	67.4	19.3	70.6
1998	306	----	25.3	57.7	43.9	*6.0	*17.4	34.3	14.9	22.0	67.7	-	71.4
MID 1999	*310	----	25.0	57.3	43.7	5.9	17.2	34.2	14.5	21.7	67.1		70.5

	2 FC MADE	2F : ATT	%
995	*20.5	*42.4	48.2
MI) 1996	20.1	42.1	47.8
996	19.8	41.3	47.9
MI) 1997	19.2	40.6	47.3
997	19.5	40.8	47.9
MI) 1998	19.5	40.7	47.9
998	19.3	40.3	47.9
MI) 1999	19.1	40.1	47.6

*All-time high

NOTE: Averages and percentages are for each team per game.

1998-99

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