

**Annual Research Report
Of the
NABC
Research Committee**

By:

Dr. Jerry Krause Chair

*National Association
of
Basketball Coaches Convention
Minneapolis, Minnesota
March 2001*

2000-01
Research Committee Report
Minneapolis, Minnesota
March 2001

I. 2000-01 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 _____ 28
- b) Awarded/in-progress _____ 7
- c) applications pending _____ 4 **See TAB A.**

2. Publish basketball research in the NABC Courtside.

STATUS: Research articles/reports/grant abstracts are edited and submitted for publication. Must adapt process to NABC website.

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 thirteen-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. **See TAB B.**

In 1997-98, a preliminary pilot study was begun to examine the extent of variability on ball-floor interactions. No significant differences were detected in the pilot study using a variety of floor surfaces. 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.

In 1999-00 testing experiments were carried out in the Mountain West Conference, the NCAA I Men's tourney sites, and NAIA É, II Men's and Women's tourney sites. **See TAB C.**

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 or NABC website

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 NABC Board has agreed to carry forward official equipment recommendations for rules changes yearly as approved by the Board. **See TAB D.**

D. Develop and maintain the NABC Research Committee link on the NABC website.

STATUS: The design and implementation of the NABC website will be the primary focus of the committee's Minneapolis meeting.

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National Association of Basketball Coaches
Research Committee

RESEARCH GRANT REPORT

Spring, 2001

A. History

1. Created/authorized in 1983-84 with a maximum of \$1,000 per grant and no more than ten per year.

2. Approved/Completed grants - 28

Dan Smith - Imagery Training in Basketball, 1984.

Peter Ryan - Prediction of Free Throw Shooting Accuracy in Basketball, 1986.

Steve Brennan - NCAA Division I Basketball Officials Survey, 1986.

Ralph Schuetzle - The Relationship of Free Throw Shooting to Game Outcome, 1988.

James Kayajan - NCAA Basketball Rules Changes 1970-1986 and Their Effect on the Game, 1988.

Ken Swalgin - A Computer Assisted Individual Player Evaluation System for NCAA Division I Basketball, 1988.

Gerald Myers/Bill Kozar - Influence of Selected Basketball Game Situations on Free Throw Shooting (2 parts), 1989.

Gundar Andreason - A Followup Study on the Effect of the Three Point Field Goal on NCAA Division I College Basketball, 1988.

Dennis Phillips - The Evaluation of International Basketball Rules and Their Effect Upon the Game, 1990.

Jim Brandenburg/Bob Metchikoff - Perceptions of NCAA Division I Basketball Coaches Regarding the Influence of Selected

- Player Characteristics and Game Situations on
Free Throw Success, 1991.
- Jeffry Kohls - The Effects of Flexibility Training on Vertical Leap, 1992.
- Craig Jonas - The Three Point Shot in College Basketball - A Statistical Assessment
and Coaching Implications, 1992.
- Bobby Dye/Bill Kozar - The Changes in Free Throw Importance as a Basketball
Game Proceeds, 1992.
- Mark Few - The Relationship of Three Point Field Goal Shooting to Game Outcome
in Men's College Basketball, 1992.
- Michael Madagan - Hiring Criteria Used by Division I Head Men's Basketball
Coaches, 1993.
- Mark Hein - Leadership Preferences of Male College Basketball Players, 1993.
- Steve Brennan - The Birth and Evaluation of the Zone Defense in the Game of
Basketball from 1891 to 1992, 1993.
- Robin Hester - Collective and Self-efficacy and Their Relationship to Team and
Individual Performance in Male Intercollegiate Basketball Players,
1994.
- Raymond LaBate - A Comparison of the Effects of a Target Rim on the Basketball
Shooting Accuracy of Intercollegiate Basketball Teams, 1994.
- Robert Schneider - The Effects of a Target Rim on Male College Basketball Players,
1994.
- Ron Cox - Effects of an Aiming Device on Basketball Shooting Accuracy and
Self-Efficacy, 1995.
- David DeFerrari - NCAA III Basketball Player Dropout Reasons, 1995.
- Stan Morrison/Lee - Critical Factors in Forecasting Success of College Basketball
Teams, 1995.
- Jeff Jonas - Trash Talking Study, 1996.
- Brian Priebe - Turnover Effect on Winning, 1996.

Sam Dixon – A Study of Academic Learning Time – Physical Education and Opportunity to Respond to Determine Teaching Effectiveness of College Basketball Coaches, 1997.

Scott Eaton – Computerized Administration Application of NCAA Men’s Basketball Programs, 1999 B.

Bob Schneider – The Three Point Shot: Is It Becoming Too Much of the Offense?, 1996, (\$950).

Approved/Ongoing - 12

Steve Brennan - Trait Sport Confidence of College Basketball Recruiters, 1993, (\$1,000).

Scott Eaton - Computerized Administration Applications of NCAA Men’s Basketball Programs, 1994, (\$1,000).

Mark Boyea – Basketball Coaching History – Phase I, 1996, (\$1,000).

Bill Kozar/Rod Jensen, et al – The Influence of the Three Point Shot on College Basketball (\$1,000).

Mike Blum – Values and Ethics for Basketball, 1998 (\$50).

Will Collenan – Decision Making and Stress of College Basketball Coaches, 1998 (\$1,000).

Doug Peters – Recruiting Factors in NCAA II Basketball, 1998 (\$1,000).

Brent Williams – An Anaerobic Fatigue Test for College Basketball, 1998 (\$120).

Bob Baker – The Development of an Instrument to Assess the Phenomenon of “Trash Talking” in Sport, 2000 (\$1,000)

Steve Brennan – Coping Methods of Male and Female Division I Basketball Referees under Stressful Game Conditions, 2000 (\$1,000)

Deron Grabel – Leadership Styles of NCAA I Men’s Basketball Coaches, 2000 (\$1,000)

Mike Voight – Sources of Stress and Coping Strategies of Collegiate Basketball Referees, 2000 (\$955)

Basketball Equipment Testing

1. Research Rationale
 - The profession of coaching
 - Solution of basketball problems
 - Ethics - duty to serve
 - character base
2. History
 - 1980 origin—research chairman
 - Criteria - player safety
 - standardize equipment
 - equity and fairness of competition
3. Focus
 - Rim/backboard/support system
 - Ball/floor
 - Other – clocks/training aide
4. Results – over 51 specific equipment improvements
 - Most during Steitz era
 - Example breakaway rim/glass backboard/portable support systems
5. Primary Equipment Problem – baskets (ring/rim)
 - Baseline standard (1976) – rigid ring with 18 inches inside diameter, weight of 11 lb. and 40% rebound/elasticity
 - 1977 breakaway ring introduced
 - player safety (protect hands by absorbing impact energy)
 - weight 20 – 22 lb. (not controlled by rule)
 - increased forces on rims and backboard (added a rules recommendation)
 - increased weight and safety (required safety strap restraint)
 - change of rim to machine with moving parts with wear and tear (not controlled by rule)
 - non–positive or positive lock rules change
 - field adjustable rule requirement
 - rim testing only recommended
6. Breakaway Rim Experimentation (1986-2000)

- Identify Problem (changes in game)
 - Rebound distance
 - Shooting percentages
- Development of Testing Device
 - Inadequate manufacturer response
 - NABC sponsored experiments (10 years/\$125,000)
 - Valid, reliable testing instrument
- Determine Reasonable Play Parameter for Rebound/Elasticity
 - High school, college, professional site sampling
 - Comparison with rigid rim
- Wear and Tear Testing
 - Eight years
 - Variability is increasing (use of breakaway rims and lack of regulation)
 - Rims too loose, too tight or too different
 - Differences from court to court and basket to basket
- Testing and Control
 - 60% of variation in rim
 - Trust but verify by testing
 - Preseason and pretourney

7. 1997-2000 Experimentation

- Regular Season
 - 97-98 Southeastern Conference
 - 98-99 Missouri Valley Conference
 - 99-00 Mountain West Conference
- Tournament Play
 - 97-00 NCAA I Men's Tourney
 - 97-99 NAIA I Men's Tourney
 - 99-00 NAIA, I, II Men's and Women's Tourney
- NBA Adoption and Use
 - NCAA range (35% - 50%)
 - NBA range – new rim standard (20% - 30%)

8. 1997-00 Experimental Results

- 97-98 Southeastern Conference – 10 of 12 failures
- 97-98 Tournament Sites (NCAA I, NAIA I) – 13 of 14 failures
- 98-99 Missouri Valley Conference – 10 of 10 failure
- 98-99 Tournament Sites
 - NCAA I Men's Requirement (no verification)
 - NAIA I Men's 1 of 1 failure
- 99-00 Mountain West Conference – 9 of 10 failures (Rules Committee Chair site passed)
- 99-00 Tournament Sites

- NCAA I Men's Requirement (no verification)
- NAIA I, II Men's and Women's – 4 of 4 failure

9. Rebound/Elasticity Testing Issues

- Problem/Need
 - Affects the game (rebound distance and shooting percentages)
 - Variability increasing
 - Competitive advantage due to equipment
- Conflict of Interest
 - Royalties and patent (royalties to NABC)
 - Developmental costs
- Manufacturer Involvement
 - Original offer to all
 - Porter and BPI development
 - Available to all manufacturers
 - Porter Athletic Co. commitment
- Ethics
 - Equity /fairness (equipment affect on game outcome)
 - Gamesmanship/home court advantage
- Cost (\$1,000 per testing device)
 - Purchase options (one time only)
 - a) Individual school Men and Women's programs
 - b) Conference sharing
 - Free maintenance and testing check (height, rebound/elasticity, adjustments and wear)

10. Millennium Rules Recommendations

- Ball-rim interaction rule change (Rule 1, Section 13, Paragraph 3)
 - Require rim testing
 - Pre-season and pre-tournament “It is required that all competitive rings be tested prior to each season and prior to post season tournament play for rebound- elasticity to ensure this factor is controlled for equitable competition”
- Ball-drop test prior to game-point of emphasis for rules
 - Officiating mechanics
 - Ball – floor interaction basis for consistency
- Basket height rule recommendation
 - Recommended tolerance range for maintenance emphasis
 - Tolerance of 10 ft. \pm in.

Mountain West Leads the Way into New Millennium

By

Jerry Krause NABC Research Committee Chair

The Mountain West Conference, whose Commissioner is Craig Thompson (also Chair of the NCAA I Men's Basketball tournament Committee) and member Air Force Academy, whose coach Reggie Minton is Chair of the NCAA Men's Basketball Rules Committee, cooperated with the NABC to ensure basketball equipment equity in the 21st century.

When the breakaway rim was introduced over twenty years ago, the rim was lauded for reducing the possibility of hand injuries and protecting rims and backboards from breakage. Little was known about the long-term effects of this rule change. Research since then under the auspices of the National Association of Basketball Coaches (NABC) has confirmed that the solution of the rim/glass backboard and hand injury problem inadvertently led to the creation of another problem – rebound variability and the possible play inequities from that situation.

Critical equipment for basketball that affect playing and mechanics of the game are the ball, rim, backboard and the floor. NABC studies have focused on that equipment for over 20 years in order to ensure player safety, equipment equity and quality control. It was found at all levels of basketball that the wear and tear on breakaway rims has produced differences in how the game is played, i. e., variability in ball-rim rebound that affects rebound distance and shooting percentages. That is, newer/tighter rims produce longer rebound and lower shooting percentages than old and worn/looser rims. This problem was compounded by a rules change, which allowed rim adjustability but didn't require testing for maintenance of reasonable rebound standards.

A rim testing solution was developed 15 years ago by the NABC with the longtime support of Porter Athletic Equipment Co. This testing device, called the Faircourt, allows any school to test the rebound/elasticity of any rim/backboard/support system to ensure compliance with reasonable rebound standards as specified by NCAA rules (a range of 3.5% to 50% - from too hard/tight to too soft/loose or worn).

Using these NCAA standards, experiments have taken places for the past three years to determine the extent of the problem. The testing and results:

- Southeastern Conference (97/98) – 10 out of 12 courts failed.
- NAIA I, NCAA I Men's Tournament Sites (97/98) – 13 of 14 courts failed.
- Missouri Valley Conference (98/99) – 10 of 10 courts failed.
- NAIA I, NCAA I Men's Tournament Sites (98/99) – all tested sites failed.
- Mountain West Conference (99/00) – 8 of 8 courts failed.

The Mountain West Conference conducted testing prior to the 99/00 conference season and all game sites were brought into compliance by breakaway rim adjustment (most common), adjustment/maintenance of equipment or rim replacement. Replacement rims were required with rims that were too worn or where breakaway rims were not adjustable as recommended by rule. This is a related problem compounded by NCAA rules which allow adjustability but not required rim testing – some manufacturers are now producing rims with very limited or no rebound adjustments possible.

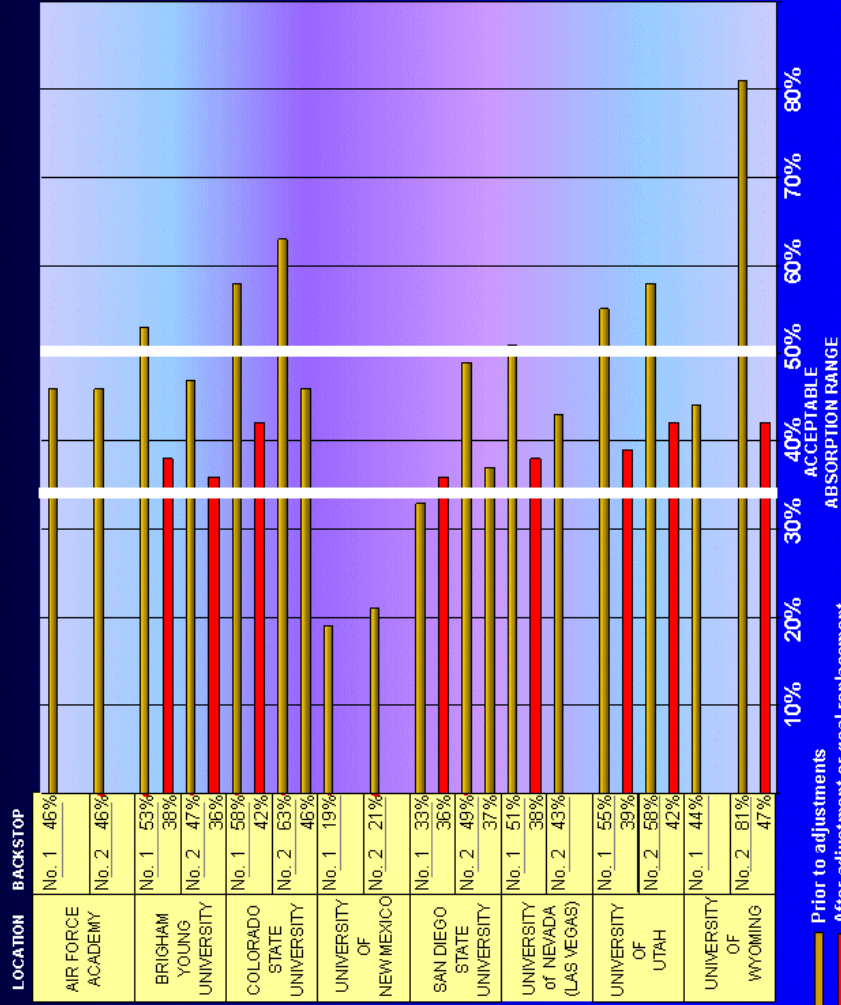
Conclusion

The solution is clear; breakaway rims introduced over 20 years ago have solved many problems of hand injuries and rim/glass backboard breakage, they have improved the game. However, these same rims have caused rebound/elasticity variability problems. In addition the problem is increasing; rims have mechanical moving parts that wear out and require testing and adjustability/replacement. The problem occurs in over 90% of courts at the highest level of college basketball, NCAA I. What should we expect at all levels of basketball?

The NBA and International basketball (FIBA) requires rim testing. Isn't it time for college basketball to enter the 21st Century in basketball equipment equity and fix this problem? Preseason and pre tournament testing as recently conducted by the Mountain West Conference and the NCAA I; NAIA I Men's tournament Committees is a practical solution to standardize the game from gym to gym, from Portland, OR to Portland ME. Why not make it universal for all of basketball?

Would you like to be the coach or player in an important game that must shoot and rebound on rims that are too tight, too loose, or too different? What if you had to shoot on the "tight" rim the second half while your opponent was shooting on the "loose" rim! Lets make it a "Faircourt" for all participants, and require preseason and pre tournament rim testing at all levels of basketball. It is a realistic, feasible fix to improve this basketball area.

MOUNTAIN WEST CONFERENCE RIM REBOUND/ELASTICITY TESTING



■ Prior to adjustments
■ After adjustment or goal replacement

REBOUND ELASTICITY OF RING (ENERGY ABSORPTION OF GOAL AND SUPPORT SYSTEM)



DEPARTMENT OF THE ARMY
UNITED STATES MILITARY ACADEMY
West Point, New York 10996

TAB D

REPLY TO
ATTENTION OF

March 2001

Mr. James Haney
National Association of Basketball Coaches
9300 West 110th Street, Suite 640
Overland Park, Kansas 66210

Dear Jim,

Enclosed is an *After Action Review/Report* on my post meetings with the *NCAA Basketball Rules Committees*. As you know, this trip was conducted in my role as *NABC Liaison* to the *Basketball Rules Committee*.

As you will see from my report, I am frustrated with my attempts to optimize my effectiveness as *NABC Research Chair* in order to improve basketball.

I am proposing that the research committee focus on these areas:

1. Basketball equipment research – will need the full support of the Board for this to be effective. My recommendations need the weight of the *NABC Board* – we are the only ones in basketball doing equipment research.
2. Selected research projects identified by the Board. What surveys do you want done? What information is needed? What problems need to be solved?
3. *NABC Basketball* publications, books, etc. that I will submit periodically submit.
4. Develop and maintain the NABC Research Committee link on the NABC website.

I would appreciate your input as I continue to strive to do what is best for all of basketball.

Sincerely,

Jerry Krause
Chair, NABC Research Committee

Enclosures

cc: Gene Kendy
2000-01 *NABC* President
Purdue University
Roy Williams
University of Kansas

Summary Report
of
NCAA Basketball Rules Committee Meetings
by
Jerry Krause, NABC Research Committee Chair

A. Issue: Rules Committee Makeup

Discussion: It appears that fewer coaches, active or past, makeup the membership. In recent past, committee members generally were basketball coaches with over 200 years of collective basketball coaching experience.

Recommendation: Develop a proactive plan within the *NABC* to recruit and nominate active coaches or ex-coaches from the basketball world.

B. Issue: Committee Meetings/Operation

Discussion: Most committee reference materials (statistics, guidelines, reports, research, rules change proposals, and questionnaire results) are given to members in a large packet. Little opportunity is given to prepare, read/reflect, and discuss these important materials in the one meeting per year format.

Recommendation: A complete packet of materials should be available to members a minimum of two weeks prior to the annual meeting (for preparation and study). Other considerations could be:

- Complete agenda with outline of primary discussion areas
- Method for all attendees to add items to the agenda after the first day of meetings
- Possible use of conference calls prior to meeting
 1. during the year
 2. to prepare and follow-up on unforeseen problems areas
- Rules-related articles in the *NABC Courtside* (Rules Committee Chair, *NABC* Research Committee Chair, Rules Editor, etc.)

C. Issue: Committee Leadership

Discussion: Since the death of Ed Steitz, it is my opinion that the past strong leadership role provided by the Secretary-Editor has changed. This appears to change the leadership dynamics of the committee.

Recommendation: Prepare the Chairman to take an increased leadership role – know the process and committee guidelines completely and convey it to members.

D. Issue: Rules Changes – relative to equipment

Discussion: In the past, careful attention was given to basketball equipment (ball, floor, rims, backboards, support systems, timing/scoring devices, etc.). The Secretary-Editor and *NABC* Research Committee Chair worked diligently to improve basketball equipment in order to protect players and the equipment, ensure equity, and provide greater control. The *NABC* and the Research Chair have been closely involved in this process for over 20 years. Experimentation was initiated and conducted to develop specific rules recommendations relative to equipment. With the strong advocacy of Dr. Steitz and myself, over 50 equipment rules changes to improve basketball equipment were made. Almost all of these occurred prior to the tenure of Nichols and Bilik. In fact, almost every equipment rule recommendation made prior to that time was adopted. This equipment area has been degrading for over 18 years even though *NABC* experiments to identify, clarify and prove the problem have been conducted regularly and in much detail.

Recommendation: The equipment area is one basketball rule area that truly fits the *NABC* slogan “**to be the Guardians of the Game**”. There is no other group or mechanism in basketball that is designed to address this area. The *NCAA* avoids equipment issues like the plague unless there are endorsement dollars involved. The rules Committee made few meaningful equipment rule changes in ten years. In my opinion, the *NABC* needs to carry the equipment torch.

These carefully researched recommendations should be brought to *NCAA* Rules Committee with the full force and support of the *NABC* and its Coaches who are on the Committee. These are changes based on solid research from the Guardians of the Game. I recommend a review process on the *NABC* Board or *NABC* Rules Recommendation Committee and strong support for adoption. If the *NABC* is to affirm its *guardian role*, then it is time to step forward. Otherwise just focus on the visible things that everyone is focused upon and drop the appearance of support – it is a waste of time and service to basketball, and the *NABC*.