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Training and Research Projects by Sport

Baseball—Video-based Pitch Recognition Training (for batters)
and video-based Pitcher Analysis (for coach)

Venues:

- Purdue University Baseball Team (2000-2001)
- Central Catholic HS Baseball Team (2001)

Technology: video training (live)

Focuses: improving batters' pitch recognition; testing video training approach in preparation for building computer program; analyzing Purdue pitchers to help in planning season

Pitch Recognition Training Results: Training Group of nine Purdue batters had statistically significant improvement in season performance (batting average)

Pitcher Analysis Results: Querying the 3000 pitch database helped coach determine pitching strategies (e.g., change up worked well for most pitchers against opposite hand batters)

Description: Batters watched video tape of pitchers [shot from a batter's view] on big screen and predicted pitch type and location. The work with Purdue was my dissertation research and a proof of concept for training pitch recognition as mental skill – separate from physical swing training. From this work I developed the pitch recognition computer program [IAV-Softball]. I developed the program for softball because my daughter was a softball player preparing for college.

Comment by Frank Wren (Atlanta Braves): "You're getting at the difference between 5 o'clock hitters and 7 o'clock hitters."

Comment by Eric Anthrop (Central Catholic, then Eastern Kentucky): "It was like I had seen it before. All I had to do was put the bat on it." (after home run in playoffs)

Softball—Computer–based [IAV-Softball] Pitch Recognition Training

Venues:

- SIU Softball Team (2005)
- John Logan CC Softball Team (2004-2005)
- Indiana U.-Purdue U. (Indianapolis) Softball Team (2006)

🎬 Alicia Spack (freshman, U Florida) (2003-2004))

🎬 Elizabeth Fadde (freshman, U Kentucky) (2003-2004)

🎬 Maria D'Amico (senior, SIU, 2005) led Mo Valley in RBI, tied team home run record for season, and improved slugging percentage from 3 year baseline by 77% to .613.

Technology used: IAV-Softball (laptop computer video training)
Focus: Improving batters' pitch recognition
Results: In all cases to-date there has been improvement over past performance (and in cases where I had a control group, namely SIU, the training group improved more than the control group did). IAV-Softball:

- does improve batting average
- does improve slugging percentage
- does not raise numbers of walks (or on-base percentage)
- does not help batters with mechanical problems in their swings

Description: Players use IAV-Softball to improve their pitch recognitions skills by identifying pitch type, and predicting pitch location. The IAV-Softball computer program keeps track of their scores. The program allows a player to work on type and location separately or together and also allows one to work on particular zones. In the venues above I worked out a range of training programs to fit the needs of the players involved, building in progressive difficulty (as video game levels do).
Comment by SIU Asst. Coach Buddy Foster (now Drake head coach): "This program seems most helpful to players with good swings who have concentration problems at the plate."
Comment by Maria D'Amico (in SIU Daily Egyptian): "My success this season came from being more comfortable at the plate and seeing the ball better."

Basketball—Video-cued Visualization Training

Venue: SIU Women's Basketball Team (Spring 2005)
Technology Used: Video Editing and Visualization Training
Description: Coach edited 40 decision points (ten second clips) from coach's video (high sideline) of previous season for team's sophomore shooting guard. Coach wrote comments for each decision. Player reviewed her decisions while visualizing her on-court Point-of-View for the decision she made and the alternative decisions she could have made. Player extended visualization to opponent film study.

Basketball—Self-Scout Training on Envisioning Roles

Venue: Purdue University Men's Basketball Team (Summer 1991)
Technology Used: Video Editing and Self-Study Questions
Description: For the players with limited game experience in 1990-1991, I edited their season game footage into separate offense and defense videotapes. I then supplied review questions for summer self study.
Results: Not successful because coaches did not follow up with players on their study.

Football—Defense Training: Linebacker Pre-snap Reads
Venue: Purdue Football Team (2007, in season)
Technology Used: Edited Videotapes
Focus: Rapid recognition of pre-snap read of opponent formation, personnel grouping, and backfield set. Prediction of run or pass based on reads.
Description: Graduate Assistant edited training tapes from weekly opponent-scout videotapes in which sideline and end zone views (behind defense) were cut to focus only on pre-snap read and immediate post-snap action – before the play type was committed. Players quizzing using answer sheets that accompanied the tapes.
Results: Players accepted and used tapes. Starting outside linebacker—who had play offense entire career, said helped make transition.

Football—Defense Training: Linebacker Pre-snap Reads
Venue: SIU Football Team (Spring 2005)
Technology Used: Edited Videotapes
Focus: Rapid recognition of pre-snap read of opponent formation, personnel grouping, and backfield set. Prediction of run or pass based on reads.
Description: Coach edited pre and post-test and training tapes from previous season's self-scout in which sideline and end zone views (behind defense) were cut to focus only on pre-snap read and immediate post-snap action – before the play type was committed. Players worked in pairs and took turns quizzing each other using answer sheets that accompanied the tapes.
Results: Players in pair-quiz condition improved substantially more than players in self-quiz condition and normal-viewing control group. One pair of red-shirt freshmen linebackers improved from 50-60% to 80-90% on pre-post tests. Variations on the Pre-Snap Reads approach for making quiz tapes out of game footage is being developed with other position coaches.

Football—Read and Key Training Video
Venue: Purdue University Football Team (Spring 1996)

Technology Used: Lexicon Video Editing/Analysis System
Focus: Formation Recognition Training for Defense
Description: Every defensive play where the end zone video was shot from behind the defense (player point of view) was edited to show sideline to snap of ball and end zone from pre-snap to commitment of offensive play type. Defensive players, especially linebackers, studied the tape to recognize their keys and predict play type (run to/run away/pass).
Results: No formal study, but positive self-reports from players to coach. Coach felt players were "on the same page" more than most spring practices.

Football—Defense Training
Venue: Purdue University Football Team (1997)
Technology Used: Computer Game in Visual Basic called "No False Steps"
Focus: Formation Recognition Training for Defense
Description: Built computer game that quizzed players on formation recognition. They got points for both speed and accuracy, and got to play each other.
Results: used informally, with positive self report. Too few plays in computer program for systematic training.

Technology Consulting

Technology Company: XOS--Football
Description: Currently I consult with XOS on its development of virtual reality training for use in football (debuted at 2006 AFCA Convention). I have analyzed work at the University of Michigan Virtual Reality Lab, traveled to Australia to gather information on the work there, and done research reports on various components of virtual reality and training.

Football—Video-Game Analysis System
Venue: Purdue University Football Team
Technology Used: Avid Sports in 1996 and Pinnacle in 2003
Description: Researched and implemented the purchase, installation, and use of computer-based video game analysis for the football team at Purdue for 13 years.

Basketball—Beta Test Video Video-Game Analysis System
Venue: Purdue University Basketball Team (2000)
Technology Used: XOS

Description: Convinced XOS to use Purdue as a beta site, installed, trained users, and reported results.

Softball—Dartfish Swing Analysis

Venue: Purdue University Softball Team (2001)
Technology Used: Dartfish
Description: Introduced the team to Dartfish and helped them develop a way to use that software to analyze their batting swings and pitchers.

Golf—Dartfish Swing Analysis and Commercial Training Film

Venue: Purdue University Golf Program (2000)
Technology Used: Dartfish for analysis; Betacam video production.
Description: For the high school students in the golf camp I developed a method for using Dartfish to analyze their swings, and then I worked with the golf coach to film and edit a training film for golfers to improve their swings.

Diving-Digital Video Replay System

Venue: Purdue University Diving Team (2002)
Description: Consulted on a DVR-based dive analysis program. Players would look at their dives immediately after leaving the pool.

Baseball-Pitch Recognition Forum

Venue: Southern Illinois University (2005)
Description: Web-based discussion forum for coaches to explore issues and drills related to training pitch recognition. Presents PowerPoint presentation from ABCA and Collegiate Baseball article (see Presentations and Publications). Also recommended batting instruction books relating to pitch recognition and drills suggested by other coaches for pitch recognition.

Presentations and Publications

Collegiate Sports Video Association (May 2004)

Title: Beyond Game-Analysis: Interactive Football
Description: Presentation outlined use of video-game analysis systems for training decision-making in football.

American Football Monthly (May 2004)

Title: Training Mental Speed in Football
Description: Article describing ways of editing video and making study tapes to increase the impact of players' voluntary video study.

American Football Monthly (June 2004)

Title: Talking Cut-ups: Advanced Video Study
Description: Follow-up article describing a particular method of making study tapes to increase the impact of players' voluntary video study.

Association of Educational Technology and Communication (October 2005)

Title: How Real Does Virtual-Reality Really Need to Be?
Description: Presentation describing the potential for training complex psychomotor skills in sports, military, and emergency response by using lower-cost training tools that target perceptual and decision skills rather than high-fidelity simulators that train the whole skill.

American Baseball Coaches Association (January 2005)

Title: Pitch Recognition: Don't Just Preach It, Teach It
Description: Presentation on research on using video to train pitch recognition in baseball and the emphasis on selective hitting in modern baseball.

Collegiate Baseball (February 2005)

Title: Pitch Recognition: Don't Just Preach It, Teach It
Description: Article (invited follow-up to ABCA talks) reporting on research involving training of vision skills and pitch recognition decision skills.

American Educational Research Association (April 2005)

Title: Self-Regulated Learning in Interactive Video Training
Description: Presentation describing the ability of mature, motivated learners (varsity softball players) to "coach" their own training using a computer-video training program (IAV-Softball).

International Society for Sport Psychology (August 2005)

Title: Situated Research on Perceptual and Decision Skills in Sports
Description: Presentation describing the value and problems with conducting training-based research with competing athletes in authentic sports performance situations.

Title: Decision Scoring in Sports
Description: Presentation describing an approach to measuring decision-making in sports separate from the execution of the skill.

Title: Interactive Video Training of Pitch Recognition in Softball
Description: Presentation describing the computer-video training of college softball players. One of few such studies to report effects of

training on game performance.

State University of New York - Courtland (October 2005)

Title: Interactive Video Training of Perceptual and Decision Skills in Sports

Description: Part of Digital Video Analysis Thematic Lectures at SUNY-Dartfish partnership announcement. Presentation describing video-computer training of perceptual skills in closed sport skills such as pitch recognition and return-of-serve and also training of decision skills in open sports such as basketball, soccer, hockey, and football.