



DEVELOPMENT AND VALIDATION OF MATCH ANALYSIS SYSTEM OF PLAYING ABILITY ON MEN HANDBALL TEAMS

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Abstract:

The purpose of the study was to develop and validate a match analysis system of playing ability on men handball teams. To achieve the purpose of the study the top four teams those who participated in the Madurai Kamaraj University Inter-Collegiate Handball Tournament 2017-18 for men were selected. The teams were SVN College, American College, Arul Anandar College and Madurai Kamaraj University, Madurai. The age of the men handball players ranged from 18 to 24 years. Totally the 15 match analysing factors which are expected to give the complete performance of the team & individual were selected and from that 6 factors were finalized. A panel of experts consisting of coaches, players and experts as well as fellow researchers aided in the development and ranking of performance scores for the effects of each skill as it is performed during the game. In this study Software was developed by the investigator with the help of computer experts for analyzing the Handball matches. The entire process of designing and developing digital match analysis system was done with the help of Microsoft .Net 3.5 (C#). Front end .Net 3.5 (C#) and backend Microsoft SQL Server 2005. A pilot work was done during practice match to see its effectiveness. The data was collected during the real time match. The shortcomings in the software were corrected during the stage of pilot work. A match in the above said tournament between SVN College and American College, Madurai was digitally analysed. Initially team and players names of either team were registered in the digital system. Similarly details about the tournament, its format, venue and toss were entered in the system. SVN College, Madurai won the toss and chosen the side. By clicking the START MATCH button it will reach the match analysis part in the screen. The coaches and media persons were asked to rate the digital match analysis system in hundred point scale in the feedback form. The range of the scale shall be between 0 and 10 points. 0 stands for poor and 100 stands for excellent. It was concluded that the digital match analysing system would be very much helpful to the Coaches, Players, media persons and Physical Educationists in enhancing the performance level of the Handball players.

Key Words: Development, Validation, Notational Analysis, Handball & Men

Introduction:

Team handball is a complex sport game that is determined by the individual performance of each player as well as tactical components and interaction of the team. Team-handball is an Olympic sport ball game that is characterized by fast pace defensive and offensive action during the game with the objective of the game to score goals. To score goals, the offensive players (6 players and one goalie) attempt to establish an optimal position for the throwing player by fast movements over short distances performing powerful changes in direction (with and without the ball), one-on-one action against defensive players and passing the ball using different offensive tactics. To describe team-handball play, especially to determine factors that influence performance is difficult because team-handball play is complex and multi-factorial. Team-handball players have to coordinate their movements well for running, jumping, pushing, change of direction and team-handball specific movements of passing, catching, throwing, checking and blocking (Pori et al. 2005). Traditionally, notational analysis for handball has focused on the analysis of movement and different patterns of play during the game. However, only a few studies have addressed specific handball tactics in order to change the game or practice strategy. Performance analysis plays a key role in this coaching cycle. Starting from the top, "Performance" means the performance in the game or training. "Observation" can be from the coach or video camera. Since research indicates that coaches are able to recall fewer than half of the key incidents that arise during the game, video camera is a better way which can record all the key events for further analysis. Notational analysis usually uses specially prepared grids of the field or court of play and various codes to mark and create a detailed map of each action as it happens. Currently, various notational systems are used to describe movement and playing patterns in sports and games. Notation systems have been applied to virtually all sporting situations. Each system is unique in purpose and its methodology is specific to that purpose. It would be exhaustive to describe each and every notational system published (Gillet et al. 2009).

Methodology:

The purpose of the study was to develop and validate a match analysis system of playing ability on men handball teams. To achieve the purpose of the study the top four teams those who participated in the

Madurai Kamaraj University Inter-Collegiate Handball Tournament 2017-18 for men were selected. The teams were SVN College, American College, Arul Anandar College and Madurai Kamaraj University, Madurai. The age of the men handball players ranged from 18 to 24 years. Totally the 15 match analysing factors which are expected to give the complete performance of the team & individual were selected and from that 6 factors were finalized.

- ✓ Total goals scored by each team
- ✓ Total Number of throw at goal by each team
- ✓ Total Number of passes by each team
- ✓ Total Number of Penalty Shot
- ✓ Total Number of goal saved by each team
- ✓ Ball Possession

A panel of experts consisting of coaches, players and experts as well as fellow researchers aided in the development and ranking of performance scores for the effects of each skill as it is performed during the game. Each shot was also recorded according to whether the shot was off-target, on-target, or resulted in a goal. The pass was evaluated according to the result, such as if the other team intercepted the pass or it resulted in a scoring opportunity. Penalty shot and goal saved by each team were carefully noted. Ball possession was carefully noted by two experts. In this study Software was developed by the investigator with the help of computer experts for analyzing the Handball matches. The entire process of designing and developing digital match analysis system was done with the help of Microsoft .Net 3.5 (C#). Front end .Net 3.5 (C#) and backend Microsoft SQL Server 2005. A pilot work was done during practice match to see its effectiveness. The data was collected during the real time match. The shortcomings in the software were corrected during the stage of pilot work.

A match in the above said tournament between SVN College and American College, Madurai was digitally analysed. Initially team and players names of either team were registered in the digital system. Similarly details about the tournament, its format, venue and toss were entered in the system. SVN College, Madurai won the toss and chosen the side. By clicking the START MATCH button it will reach the match analysis part in the screen. From start of the match time the investigator with help of computer expert enter appropriate column throughout the match. Match analysis is highly technical, so it needs thorough understanding and fast entering in the computer. At the end of the first half, the data was saved and first half report I & II of both the teams was generated and circulated among the coaches of either team. Similarly second half of the match was also digitally analysed and both report were generated and circulated among the coaches of both team and media person for their analysis. The investigator got written feedback from 32 coaches and 11 media person regarding the digital match analysing system. The coaches and media persons were asked to rate the digital match analysis system in hundred point scale in the feedback form. The range of the scale shall be between 0 and 100 points. 0 stands for poor and 100 stands for excellent. The filled in feedback form were collected and analysed statistically using mean and standard deviation. The mean and standard deviation of the data was presented in the table 1.

Table 1: Descriptive Analysis of Feedback Providers

Feedback Providers	Mean	Standard Deviation (\pm)
Coaches	85.49	3.41
Media Persons	83.24	4.37
Overall	84.37	3.89

The feedback results reveal that 85.49 and 83.24 points were rating by the coaches and media persons respectively. The rating of the coaches and media persons on digital match analysis system developed in the study was diagrammatically presented in the following bar diagram.

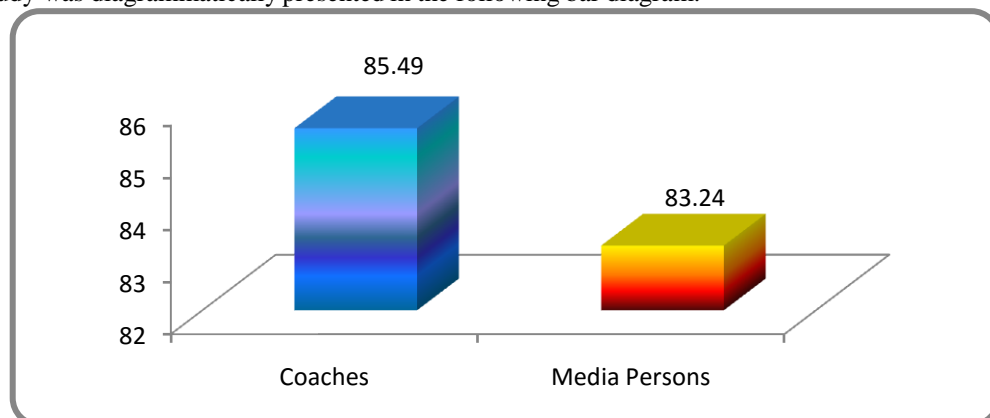


Figure 1: Mean values of coaches and media persons feedbacks

The feedback of all forty three experts were diagrammatically presented in the following bar diagram.

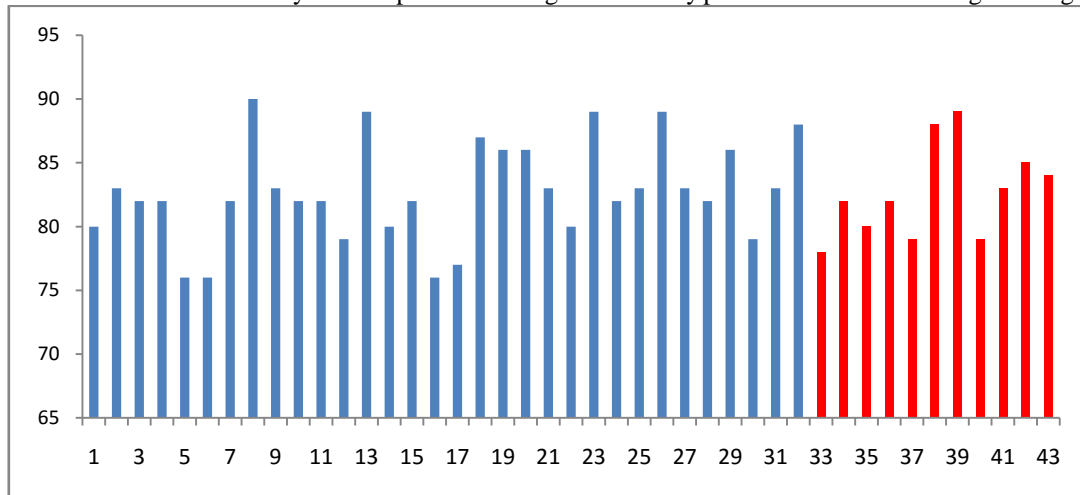


Figure 2: The feedback of all forty three experts

Conclusion:

- ✓ It was concluded that the digital match analysing system would be very much helpful to the Coaches, Players, media persons and Physical Educationists in enhancing the performance level of the Handball players.
- ✓ The outcome of the study might act as a tool to analyse the team & individual performance in the game of Handball.
- ✓ At the end it was concluded with possible enhancements in the project, it would take us to the next level in digital match analysis system in Handball.

References:

1. Barris, S. & Button, C. (2008). A review of vision-based motion analysis in sport. *Sports Med.* 38(12):1025-43.
2. Bayios I.A., Anastasopoulou E.M., Sioudris D.S., Boudolos K.D. (2001) Relationship between isokinetic strength of the internal and external shoulder rotators and ball velocity in team handball. *Journal of Sports Medicine and Physical Fitness* 41, 229-235.
3. Buchheit M., Laursen P.B., Kuhnle J., Ruch D., Renaud C., Ahmaidi S. (2009b) Game-based Training in Young Elite Handball Players. *International Journal of Sports Medicine* 30, 251-258.
4. Buchheit M., Lepretre P.M., Behaegel A.L., Millet G.P., Cuvelier G., Ahmaidi S. (2009a) Cardiorespiratory responses during running and sport-specific exercises in handball players. *Journal of Science and Medicine in Sport* 12, 399-405.
5. Gillet, E., Leroy, D., Thouvarcq, R. & Stein, J.F. (2009). A notational analysis of elite tennis serve and serve-return strategies on slow surface. *J Strength Cond Res.* 23(2):532-9.
6. Lupo, C., Condello, G. & Tessitore, A. (2012). Notational Analysis of Elite Men's Water Polo Related to Specific Margins of Victory. *J Sports Sci Med.* 1; 11(3):516-25.
7. Malagoli, L.I., Di Michele, R. & Merni, F. (2014). A notational analysis of shot characteristics in top-level table tennis players. *Eur J Sport Sci.* 14(4):309-17.
8. Pori P., Bon M., Sibila M. (2005) Jump shot performance in team-handball. A kinematic model evaluated on the basis of expert modeling. *International Journal of Fundamental and Applied Kinesiology* 37, 40-49.
9. Thorlund J.B., Michalsik L.B., Madsen K., Aagaard P. (2008) acute fatigue-induced changes in muscle mechanical properties and neuromuscular activity in elite handball players following a handball match. *Scandinavian Journal of Medicine and Science in Sports* 18, 462-472.
10. Wagner H., Buchecker M., von Duvillard S.P., Müller E. (2010b) Kinematic comparison of team-handball throwing with two different arm positions. *International Journal of Sports Physiology and Performance* 5, 469-483.
11. Wagner H., Orwat M., Hinz M., Pfusterschmied J., von Duvillard S.P., Müller E. (2014) Testing game based performance in team-handball. *Journal of Strength and Conditioning Research (In press)*.
12. Wagner H., Pfusterschmied J., von Duvillard S.P., Müller E. (2012) Skill-dependent proximal-to-distal sequence in team-handball throwing. *Journal of Sport Sciences* 30, 21-29.