

DEVELOPMENT OF INSTRUCTIONAL VIDEOTAPE FOR QUALITATIVE ANALYSIS

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One of the major concerns of the coach and Physical Education teacher is to effectively analyze movement. Sport performance is characterized by diverse movement patterns performed at high speeds. Under these circumstances the observer must prioritize movement components, detect errors and make decisions regarding the efficiency of movement. Ultimately the criteria for competence in movement analysis is the ability of the coach or teacher to administer appropriate feedback (Armstrong, 1984).

The significance of movement analysis has long been recognized, however little has been done to provide teachers and coaches with instruction in analysis techniques (Arend & Higgins, 1976; Armstrong, 1984; Barrett, 1979; Gangstead & Beveridge, 1984; Hensley, 1983; Hoffman, 1974).

Qualitative analysis is usually the only technique accessible or feasible. It is a technique which involves the description of movement using analytical methods but without actual measurement. Due to its subjectivity, the method poses the problem of serious errors in observation and interpretation.

Arend and Higgins (1976) suggested a multi-level breakdown of the information in a 3-dimensional taxonomy. In addition to considering the mechanical demands of a skill their approach to movement analysis requires an in-depth consideration of environmental constraints, performer constraints, and the role of observer expectencies.

Barrett (1983) devised a two step plan: (a) decide what to observe, and (b) plan how to observe. The plan has increased emphasis on factors which effect the observer's attention and perception, such as environmental distractions and position. Like Armstrong (1983), Barrettt strongly supports the premise that decisions and feedback made regarding the efficiency of movement must follow a systematic analysis approach. Learning how to observe objectively must precede learning to observe followed by quick value judgements. (Barrett, 1983, p. 29)

Gangstead & Beveridge (1984) developed a model to facilitate the organization of temporal and spatial components of movement. Undergraduate kinesiology students received instruction in qualitative analysis skills three times a week for eight weeks. The authors concluded that systematic qualitative analysis practices significantly improved performance on specific perceptual and diagnostic aspects of movement analysis

While the above mentioned studies are by no means the only contributions to the area of observation and movement analysis, they are representative of the type and focus of the research completed.

DEVELOPMENT OF A QUALITATIVE ANALYSIS MODEL

Following the review of literature it became apparent that a model which provided both a systematic approach to qualitative analysis and critical observational strategies, should be further developed and directed towards the practitioner. Furthermore, it appeared that the understanding of such a model would be greatly enhanced if it was presented in a manner that provided the theoretical rationales for the various concepts as well as many different sport examples. Consequently an instructional videotape was produced at the University of Alberta to present physical analysis skills to a broad audience. The program was designed to improve analysis skills by providing a detailed model for observation, with the main emphasis on the need to structure the observation process.

Effective qualitative analysis involves three stages which must be approached systematically; (a) pre-observation, (b) observation, and (c) post-observation. The pre-observation stage involves planning and organizing the observation process. The observation stage answers the questions how, when, where, and for how long to observe. Decision making and the provision of feedback, are the key features of the post-observation stage and were beyond the scope of this presentation. The effectiveness of each stage is dependent upon the quality of the previous one. The final success of the model is contingent upon the observer's knowledge about the movement as well as a fundamental comprehension of biomechanics. The following is an outline of the model proposed in the videotape presentation. The model ensued from the reviewed literature and contributions by Brown, 1984; Greive, 1971; Hensley, 1983 & Lewis, 1980.

PRODUCTION OF AN INSTRUCTIONAL VIDEO

Following the development of an appropriate analysis model, the video script and storyboard were prepared. The main objective was to systematically lead the viewer through the analysis model explaining concepts and providing sport examples wherever possible. A key concern was the desire to appeal to a

PRE-OBSERVATION

1. Decide what to observe.
 - i) Complete a simple skill description.
 - ii) Simplify the movement.
 - iii) Analyze using the principles of mechanics.
 - iv) Determine the critical features.
 - vi) Determine other relevant correlates.
2. Plan how to observe.
 - i) Re-examine and select critical features.
 - ii) Identify positions.
 - iii) Identify scanning strategies.

OBSERVATION

1. Consider factors which alter perception.
 - i) fear, excitement
 - ii) environment
 - iii) knowledge
 - iv) complexity
 - iv) speed
2. Re-consider positioning.
3. Re-consider scanning strategies.

POST-OBSERVATION

1. Make decisions.
 2. Provision of feedback.
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very broad audience. It was determined that the content of the videotape should include performers of different ages, sexes and skill levels, the physically handicapped, sequences of many different sports, and indoor and outdoor activities. An extensive University Summer Sports Camp program provided us with the opportunity to address this concern.

For each step in the model many decisions were made as to how to best present the content. The approach varied depending on the concept. For example, in the presentation of completing a simple skill description, the narrator first described the key features then provided a description of a filmed weight lifting sequence. The concept was further exemplified by a coach completing a simple skill description.

The videotape format lent itself to the presentation of structured observation. Using the camera as the "eye" of the observer, enabled us to better illustrate many of the

strategies. For example, in dealing with a discussion on the importance of positioning, the camera was able to record the effect of viewing skills from very close, from far away, and from different angles. Depending on position, the path of various body segments may appear distorted or obscured from view altogether. In addition, the observer's position may need to be adjusted according to the speed of the movement, or the distance over which the movement extends. Contrasting skills were filmed from a number of different focal points, in different environments, to clearly demonstrate the effect of position on the observation of movement.

The use of special effects such as slow motion, freeze frame, and 'zoom' videography greatly enhanced the discussions on scanning strategies and movement simplification. Instructions to the viewer to observe the skill long enough to see the total and then zoom in on the points of interest, were accompanied first by long shots of a gymnast on a beam, then by close up shots of various body segments. Other scanning strategies such as; locking or holding the movement in the minds eye, observing relationships among and between the body parts, and focusing on supporting parts, were also illustrated with special effects.

Interviews with sport scientists and coaches were included in the program to provide the theoretical basis for many of the concepts. The final editing of the videotape involved the use of a computerized graphics system. The system made possible the use of various fonts as well as superimposed text and graphics. The project culminated in the production of a 40 minute videotape presentation, which is an attempt by the authors to provide the practitioner with a model for systematic qualitative analysis. A preview audience suggested the videotape would also be useful for undergraduate Physical Education courses in kinesiology, biomechanics, instruction, leadership and coaching. While the model outlines and discusses many of the concepts and strategies necessary for movement analysis, it makes no attempt to provide the viewer with instruction on each separate strategy. Still very much needed is the development, implementation, and evaluation of a program which trains and provides practice for the teacher and coach in effective qualitative analysis.

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