

INTERACTIVE VIDEO: AN APPROACH FOR TEACHING
QUALITATIVE MOVEMENT ANALYSIS
OF THE OVERHAND THROW

by

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Thesis submitted to the faculty of the Virginia
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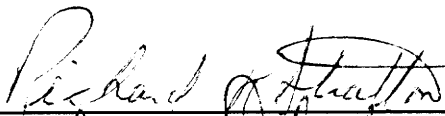
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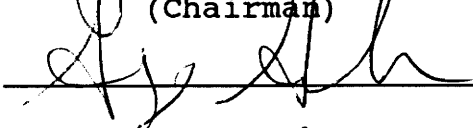
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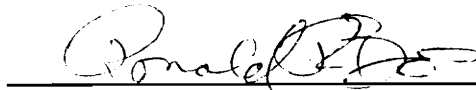
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(ABSTRACT)

The purpose of this investigation was to develop and test the effectiveness of an interactive video program for training in qualitative movement analysis. Students (n=24) from an intact elementary physical education methods class were trained to identify four qualitative standards associated with the mature performance of the overhand throw. Subjects were matched on the basis of pretest scores and assigned to receive either interactive video instruction, videotaped instruction, or no instruction. The results from an ANCOVA were significant indicating a difference between groups. Duncan's multiple range test results showed that the interactive video and videotaped instructional methods were superior to no training but there were no significant differences between groups receiving instruction. The findings from this investigation support the conclusion that the application of interactive video instruction to qualitative movement analysis is an effective strategy although it is not superior to video

taped instruction. However, its application may be beneficial in mass instruction.

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Chapter 1

Introduction

Kinesiology, the study of human movement, has contributed to knowledge and research in physical education. A primary example has been in movement analysis. Technological capabilities like cinematography, electromyography and electrogoniometry often employed by the kinesiologist have been influential in the study of movement. Take for example throwing. For nearly sixty years, it has been investigated using these techniques producing evidence and verification of throwing patterns (Branta, Haubenstricker & Seefeldt, 1984; Halverson, Robertson and Langendofer, 1982; Robertson, 1977; Robertson, 1978; Robertson, Williams & Langendofer, 1980; Wild, 1938). Thus, the conceptualization of developmental motor skill sequences has emerged (see Branta, Haubenstricker & Seefeldt, 1984).

Today, researchers and teachers practice two methods of movement analysis. They are quantitative and qualitative analysis. These methods differ in that one produces a more objective form of evaluation (Kreighbaum & Bartheis, 1981).

The focus of quantitative analysis is on the objective elements of the performance such as distance or speed and

is usually measured in numeric terms (e.g., feet, seconds); thus subjective evaluation is lessened (Kreighbaum & Bartheis, 1981). According to Branta, Haubenstricker, & Seefeldt (1984) this methodology has been popular since the early 1900's and has contributed to the establishment of "normative ages and percentiles of performance" (p.468). It has also provided support for "the concept of developmental motor skill sequences" (p.468).

Qualitative movement analysis is concerned with the "quality" of the progression of movement. This type of analysis is a more subjective evaluation and is based on the visual inspection of the pattern of movement. Wild's research in 1938 laid the groundwork for this methodology. Through cinematography she analyzed the overhand throwing patterns of boys and girls every six months from ages 2 to 7 and at yearly intervals from 7 to 12 years. Four patterns of throwing were identified which included descriptive information related to body features (e.g., whole body movement, foot placement, follow through). Since Wild, others have verified the developmental patterns of throwing (Branta, Haubenstricker, & Seefeldt, 1984; Halverson, Robertson & Langendorfer, 1982; Robertson, 1977, Robertson, Williams & Langendorfer, 1980).

For the researcher, both methods of movement analysis have been used to identify the developmental sequence of motor skill progression (Robertson, 1978; Seefeldt & Haubenstricker, 1982). Most studies have conceptualized the intra-task skill progression in terms of a total body configuration approach. Proponents (see Branta & Haubenstricker Seefeldt, 1984) of this approach believe that progression occurs along a continuum ranging from immature patterns to mature "stages." A more specific component approach is proposed by Robertson (1978). She argues that skills are better classified according to "components" and contends "stages" only exist at the component level. Based on the work of Wild, Robertson has proposed 25 stages of throwing (see Thomas, 1986). To date, only the total body configuration approach has been implemented in large scale field studies involving throwing (Graham & Metzler, 1985; Resuchlein & Vogel , 1984) while the components approach has been validated for the hop and skip (Jenkot, 1986).

For the practicing teacher, quantitative and qualitative forms of motor skill analysis are used to evaluate student performance. Of the two, Hay (1973) feels that qualitative analysis "is without question the most important analytical tool used" (p. 42, Hoffman 1977).

In agreement with Hay, Hoffman (1977) argues that physical education students are inadequately prepared for this type of movement analysis. He states:

The fundamental consideration of how, why and under what condition the physical education teacher analyzes movement have been ignored. As a result, the gap between what teachers need to know about movement and what they are being taught in undergraduate kinesiology is enormous (p. 41).

Hoffman and Sembiante (1975) compared the observational ability of physical education teachers with those of softball players and coaches. The results showed softball players scored significantly higher than trained physical education teachers. In another study, Biscan and Hoffman (1976) found that classroom teachers were able to analyze movement as well as undergraduate physical education majors and teachers of physical education. These investigations appear to support Hoffman's claim that teachers are not being adequately prepared in qualitative analysis although more recent investigations support the notion that training in observational analysis improves performance (Bayless, 1981; Morrison & Reeve, 1985).

The term "observational" analysis has been used to describe the process of motor skill evaluation used by teachers and physical education students. This process

has long been recognized as an essential pedagogical skill in the teaching of movement (Barrett, 1979a; Biscan & Hoffman, 1976, Hoffman 1977; Thomas, 1986). It has been suggested that skill in observational analysis demands a knowledge of movement and its component parts combined with accurate perceptions of that movement (Barrett, 1979b).

According to Logsdon et al , (1984), observational skills result from training and can be improved with practice and experience. This training might occur through simulated and clinical experiences to inspect and recognize abnormalities in the movement patterns of children (Hoffman, 1977). Recent investigations have provided support for this idea through the use of videotaped instruction (Bayless, 1981; Morrison & Reeve, 1985).

A relatively new educational tool which is gaining acceptance in training is interactive video technology (Floyd & Floyd, 1982). Combining computer technology with a video cassette recorder, interactive video has been described as the "intelligent video system" for its ability to store limitless patterns of instruction and provide a variety of instructional options (e.g., drill and practice, simulation) (Martorella, 1983). Interactive video is unlike traditional linear videotaped instruction in that the

"sequence and selection of messages is determined by the user's response to the material" (Floyd & Floyd, 1982, p.2). However it has not been found to be superior to traditional training practices (Floyd & Floyd, 1982)

Statement of the Problem

There is little empirical evidence to support the application of interactive video training in physical education although there have been several endorsements of its efficacy as an instructional tool (Hannafin, 1984). Advocates for its use in applied training settings (Howe, 1984 ; Floyd & Floyd, 1982) report success in cardiopulmonary resuscitation, bank teller training and flight training (see Appendix: Case studies in interactive video in Floyd & Floyd, 1982). A common element among these studies relates to the information that is communicated to the learner.

In cardiopulmonary resuscitation (CPR) training, subjects learned a standardized set of procedures which were to be followed with little variance. In the bank teller and flight training studies, subjects were also required to learn specified procedures, as well as, factual information. In all cases, there was evidence that the content of the interactive training could be learned. Therefore, if one assumes that the developmental sequence of movement (whether

viewed from a "stage" or "component" perspective) is stable, interactive video may be applicable to qualitative movement analysis training in physical education. Currently, its use has not been documented.

Purpose

The primary purpose of this study was to develop an interactive video training program for identifying qualitative standards associated with the mature performance of the overhand throw. A secondary purpose was to test the effectiveness of the interactive video training in relation to videotape training and no training. It was hypothesized that there would be no difference in the ability to identify selected qualitative aspects of the overhand throw between groups receiving interactive video training, videotape training and no training.

Significance of the Study

If interactive training is an effective method of teaching qualitative movement analysis then more opportunities for training may occur through its use. This method of training, although not superior to traditional methods (Floyd & Floyd, 1982), may offer alternatives such as mass training. Limitless patterns of instruction may be created and stored on a computer disk which focus on the

stable developmental sequences of movement. These programs of instruction may then be accessed by the student in the absence of supervision potentially increasing the number of students who receive training.

Barrett (1979a) found that planning was the first step in observation training. She argues that initially it must be decided what to look for because without it there is a tendency to miss more than what is seen. Interactive training may offer the opportunity for student to plan for observation by learning to identify the key aspects of the movement under observation. By teaching students what to look for and increasing the opportunities for qualitative analysis, proficiency may be achieved in the initial development of observational ability.

Delimitations

The following delimitations were imposed by the investigator in order to conduct this investigation.

1. Performances of the overhand throw were executed by third grade students which were videotaped and used in training and testing phases of this study.

2. Movement analysis criteria were confined to four qualitative standards adapted from the Michigan Educational Assessment Program.

Limitations

This study was conducted under the following limitations:

1. Subjects indicated experience and courses which may have affected their performance.
2. Data collection occurred during the summer which did not permit follow-up testing.
3. Interactive video training was limited to skill, close-up and real time Performances of the overhand throw.
4. The ability to make observational assessments via interactive video may not be generalized to an actual teaching situation.

Definitions

INTERACTIVE VIDEO is a learner controlled technology involving the systematic manipulation of video scenes and text information via computer.

INTERACTIVE VIDEO TRAINING is a treatment condition in this study in which subject matter was self-taught via computer with video tape accessibility.

NO TRAINING is a treatment condition used in this study where subjects did not receive any instruction but were pre and post tested.

OVERHAND THROW involves the use of the hand to project an object away from the body in an explosive overarm pattern.

QUALITATIVE MOVEMENT ANALYSIS is a technique of motor skill analysis in which the quality of the movement pattern is visually inspected by an observer. It is a more subjective form of evaluation.

QUANTITATIVE MOVEMENT ANALYSIS is a form of movement analysis where the outcome of the performance is objectively evaluated based on a standard (usually numeric).

VIDEOTAPE TRAINING is a treatment condition used in this study in which information was delivered to subjects via an instructor utilizing handouts, videotape samples and discussion.

Basic Assumptions

1. It was assumed that training on an interactive video system was a novel task to subjects participating in this study.
2. It was assumed that the developmental sequences of throwing occur in a series of stages that could be identified through videotape playback.
3. It was assumed that teaching involves the process of qualitative analysis of 'students' motor performance.

Summary

Kinesiology has made significant contributions to the study of human movement, particularly in movement analysis. Quantitative and qualitative methods have been employed which have contributed to the evaluation of movement based on movement outcome and intra-task skill progression.

The two approaches which describe the intra-task progression support the assumption that development occurs in an orderly, sequential manner. A total body configuration approach conceptualized the sequence as ranging from immature patterns to mature stages. The components approach identifies stages within components creating a more descriptive evaluation.

The overhand throw has been studied extensively using both approaches. The developmental sequence from a total body configuration perspective qualitatively identifies a mature stage of throwing as consisting of 4 or 5 key aspects of the pattern. The components approach describes a mature throwing pattern as 25 stages within 4 components. In this investigation, a total body configuration approach was adopted.

Qualitative analysis has been described as the most important analytical tool for practicing teachers (cited in Hoffman, 1977). Hoffman (1977) has argued that this type of

analysis has not been taught adequately to students of physical education. More recent studies (Bayless, 1981; Morrison & Reeve, 1985) indicate that qualitative analytic ability can be improved through practice and videotape training.

One method of training relatively unexplored in physical education is the use of interactive video. Although its use has not been documented, there is reason to believe it may be applied in qualitative movement analysis training.

Chapter 2

Review of Related Literature

A review of related literature was performed to identify current research conducted in the areas of motor skill assessment, training in movement (observational) analysis, and the development and efficacy of interactive video technology. This chapter is divided into three sections which will discuss each of the aforementioned areas.

Intra-task skill development

Williams (1983) defines intra-task sequences as "...changes that take place in individual body actions that occur during the acquisition of single motor skills" (cited in Jenkot, 1986 p.11). The work of Wild (1938) laid the foundation for intra-task skill development sequences. Through the use of cinematography, she studied children performing the overhand throw then identified four patterns. These patterns have been basic to the present conceptualization of developmental sequences in throwing.

Intra-task sequences are identified through two methods: total body configuration and component sequences. However, only the total body configuration approach has been used to assess the performance of the overhand throw in

large scale field studies (Graham & Metzler, 1985: Reuschlein & Vogel, 1984).

In 1984, the Michigan Educational Assessment Project (MEAP) reported evidence to support the total configuration approach for assessing motor development of special and regular education students in physical education. Children were assessed to determine the extent to which they were mastering basic motor skills. Special and regular education students were selected from grades four (4), seven (7) and ten (10). The investigation incorporated both quantitative and qualitative measures indicating that overall performances at each grade level were lower than a pre-established (75%) attainment rate. As a result, conclusions were directed toward a recommendation for change in the delivery of physical education and/or the performance expectations (Reuschlein & Vogel , 1984).

Graham and Metzler (1985) proposed a longitudinal study, "Teacher Effectiveness in Children's Physical Education Project", (TECPEP), of elementary school children. The purpose was to determine "the impact (or lack of impact) teachers and programs have over a period of years on a variety of ecologically valid measures" (p. 6). One measure incorporated was motor skill improvement in which basic motor skills (i.e., throwing, catching, kicking, and

striking/batting) were evaluated using quantitative and qualitative techniques. For example, the throwing task required students to throw a softball ball at a target (6 ft. diameter) using an overarm pattern from a distance of 40 feet. The quantitative measure was determined by recording whether the ball hit the target or not in three trials. The qualitative measure was determined by analyzing four key aspects identified as representing a mature stage in throwing. They were: (a) side orientation, (b) arm extension, (c) weight transfer, and (d) sequential hip to shoulder rotation (see MEAP, Physical Education Film Training Manual , 1984-85 for a complete description of each aspect).

Jenkot (1986) conducted a study to investigate the feasibility of a large scale implementation of the component approach. She videotaped children in kindergarten through grade three performing fundamental motor skills (i.e., hop and skip). Coders were trained to use the component approach for qualitative analysis of these motor skills. Reliability was found to be maintained throughout the study with the exception of one component, the hop-arms. It was concluded that the component approach would be feasible in the assessment of hopping and skipping on a large scale.

Research in movement analysis

It has been stated that one aspect of teaching is the ability to make accurate and perceptive observations of children's responses to motor task problems (Logsdon et al , 1984). It is through this process, observational analysis, that teachers become aware of motor performance information. Brown (1982) suggests that teachers should develop the ability to observe in order to answer the questions of "how" in skilled movement.

In order to answer these questions, Barrett (1979b) suggests a process involving the observation of movement, as well as, skill in the ability to analyze the movement. She states that the analysis of movement has received more attention in the literature than the skill of observation. Her findings imply that training protocol should include instruction in what to look for in addition to where to look.

Competence and training in skill analysis.

Biscan and Hoffman (1976) conducted an investigation to determine whether physical education teachers and students possessed a special facility for skill in movement analysis. Three groups of volunteers (veteran physical education teachers, undergraduate biomechanic students and classroom teachers) viewed 2 identical

cartwheels, followed by 10 different ones. The same procedure was followed for a novel task. The results indicated that physical education teachers and students had an advantage over the classroom teachers when they were familiar with the task. However, no differences were found in the novel task. It was concluded that physical education training did not confer a generic ability to analyze movement. This finding is consistent with Barrett's (1979a) conclusion that skill in observational analysis must include planning. The superior performance of the physical education student and teachers when the task was familiar seems to suggest the experience may serve as a form of planning by identifying what to look for in the movement.

Biscan & Hoffman (1976) support this argument. They suggest that the differences in analytic proficiency "depend more on experience and extent of exposure to visual stimuli associated with performance of specific skills than with application of a general analytical scheme" (p. 162).

In another study, Hoffman & Sembiante (1975) compared the observational ability of physical education teachers with those of softball players and coaches. The results indicated that softball players' scores were significantly

higher than trained physical education teachers. In light of Biscan & Hoffman (1976), it could be argued that this was a result of the experience of softball players and coaches.

Armstrong and Hoffman (1979) found that experienced teachers and inexperienced teachers did not differ significantly in the ability to detect performance errors in the forehand drive in tennis. However, experienced teachers were more discriminating. This finding supports the idea that experience may serve as a form of planning by identifying critical features involved in the movement. Twelve common errors were selected to be used in the error detection test. Fifteen samples of the performance of the forehand drive were shown three times via super-8mm color film. Each sample was modified to include predetermined combinations of the 12 errors. Subjects were randomly assigned to one of four treatment groups. These groups were based on the presence or absence of performance competence information and performance outcome information.

Bayless (1981) investigated the effect of type and length of exposure to a prototypic skill in discriminating correct from incorrect performances. Physical education students were required to identify errors in technique for

the volleyball serve, spike and block. Four treatment conditions were employed: (a) one exposure to visual only, (b) three exposures to visual only, (c) one audio-visual exposure only, and (d) three exposures to audio-visual . She found that only the visual mode and one exposure produced superior detection skills.

One method that has been used consistently in skill analysis training has been videotaped instruction. A study conducted by Morrison & Harrison (1985) demonstrated that elementary education majors and classroom teachers could analyze movement after videotape training. Throwing, catching, and striking skills of children were shown to the subjects illustrating correct performance and common errors. Results indicated that scores were retained over a two month period. These findings when considered collectively with those in the previous discussion support the notion that qualitative skill analysis can be enhanced through training.

Specifically, initial training should include learning to identify what constitutes correct performance. In addition, planning what to look for during performance and experience may enhance observational ability. One method of intervention may include videotape training in which

incorrect and correct examples are shown. Bayless (1981) reports findings which imply that only one exposure to stimulus is optimal in detection. However, because the investigation involved volleyball skills, the extent of exposure in this study will follow the training protocol outlined in the MEAP project (see Reuschlein & Vogel , 1984).

Interactive video technology

Over the years, technology has played an important role in education. The next section of this paper will describe some of the contributions made in training through the use of technology.

Some traditional methods of technological training.

Educators have studied the teaching/learning process with great interest in an attempt to delineate effective teaching techniques. One contemporary technique suggested by McConnell and Fages (1980) is the use of videotaped feedback. This type of investigation began when video technology was first accessible in the 60's and has been advocated ever since. The use of bulky cameras, recording devices, playback units, and microphones provided a means of recording, preserving and re-using the teaching experience

(Frager, 1985). A review of the literature indicates that this method has been used primarily in physical education to improve specific sport skill performance but is now being used to improve training techniques.

One study compared the use of video (perceptual) models and written (symbolic) models in teacher training (Orme, McDonald, & Allen, 1966). They found that the teachers that had viewed the video model of the desired behavior improved performance. Maximum improvement occurred when both types of models were used. Allen (1967) also investigated the use of positive and negative models in conjunction with video presentation. He found that more desirable behaviors were elicited when subjects had seen the positive models.

Discrimination training is another area where videotaped feedback has been used in teacher education. Nias (1974) used this technology to increase the ability to discern different types of classroom interactions. Legee and Asper (1972) investigated the effects of producing and viewing videotapes to improve abilities in rating a teaching performance. Mertz (1972) studied the effect of split-screen videotaping on the improvement of verbal and nonverbal behavior of practicing teachers. Stuart (1979)

used videotaping to improve preservice music teachers' abilities to discriminate and analyze proper bowing and string techniques. All of these report enhanced performance after the videotaped training. This evidence of success has been corroborated in physical education (Bayless, 1981; Morrison & Harrison, 1985) which implies that videotape training may be applied in qualitative movement analysis training.

The use of interactive video technology.

The microcomputer has also proven quite successful as an instructional tool . Its ability to handle multiple variables at once is the key to its popularity in education. Not only is the computer capable of storing large amounts of information but it is also able to retrieve this information quickly. Computers can provide immediate learner feedback which is essential for effective instruction. They can also provide a variety of instructional strategies thereby accommodating learner differences.

Computer aided instruction is used as a supplement to traditional types of instruction. One of its limitations is the inability to generate realistic images (Martorella, 1983). In fact, other choices of visual representation are often better. For example, the use of slides or filmstrips

offer a very realistic, but still, picture presentation. The use of video technology is even better because it can be played back at a variety of speeds replicating correct and incorrect performances.

When the capabilities of the microcomputer are merged with those of video technology the outcome is an interactive video system. This current vogue in educational technology has been called the "intelligent video system" (Martorella, 1983) for its ability to create and store limitless patterns of instruction.

There are essentially three components to an interactive system: (a) the microcomputer, (b) the video tape recorder, and (c) the interface system which controls the communication between the two other units. The conceptual procedure to interactive video design is the systematic manipulation of two components: the videotape recorder (VTR) and the computer. The marriage of video and text has proven to be advantageous as an educational tool (Marsh, 1982).

In putting together an interactive video the designer identifies video scenes that are to be accessed during the lesson. These scenes are then integrated with computer generated text and/or graphic information. The computer presents information, accepts learner response, and provides

a variety of instructional options (e.g., drill and practice, simulation). The video scenes present information and allow for demonstration of skills. These scenes may also be used to illustrate abstract concepts.

One strong argument in the case for interactive video instruction concerns the issue of learner control. Many interactive video programs have been influenced by programmed learning models. There may be disadvantages to this approach. Student control over the content sequence is an important design consideration because students exhibit a variety of alternative routes through the same material (Laurillard, 1984). If allowed to choose, students are likely to select the route that is the most meaningful to them. Therefore, programmed learning tradition may be ineffective in the design of interactive video programs. Although learner control is advocated in interactive video design, the literature suggests controversy over the efficacy of student control versus program control (Laurillard, 1984).

A second consideration is the control of the mode of instruction. Interactive video tends to limit student control between active and receptive modes of instruction (Laurillard, 1984). Video is not totally a passive medium

however students are forced into a receptive mode requiring little initiation of thought processes. An effective interactive video program should invite the learner to become active in the process (Laurillard, 1984). It is the alternation between active and passive modes that makes interactive video instruction so effective. Still in question however, is the precise structure models should follow. If it was certain that video presentation followed by practice was the optimal design there would be no problem (Laurillard, 1984). But this is not the case. There are many variables involved in the dynamics of the teaching/learning process which lead to equally as many instructional strategies. Many of these possibilities can be addressed through interactive video because of the ability to accommodate many variables at once. The capability of the technology to address variables has contributed to its attractiveness for use in education.

The development of interactive training programs appears to have preempted developmental validation studies of instructional effectiveness (Hannafin, 1984). Limited empirical support suggests that this method of training is not superior method to traditional methods (Hon, 1982; Floyd & Floyd, 1982; Thorkildsen & Freidman, 1986). Despite the

lack of support of superiority, there have been many endorsements of its instructional effectiveness in a variety of applications.

Interactive training has been applied in cardiopulmonary resuscitation training (Hon, 1982), bank teller training, flight training and in conjunction with the Human Resource Department (see Floyd & Floyd, 1982 for case studies). Of these applications, it has been reported most often that interactive video provides a cost effective form of instruction. One indicator of cost effectiveness has been an increased number receiving training without increasing the number of instructors to deliver the training (Hon, 1982). Another indicator was the improved productivity in less time and a final indicator was the freeing of personnel to conduct regular duties (see Floyd & Floyd, 1982).

Despite these endorsements, many educators view the technology to be "trendy" while others question the theoretical foundations (Hannafin, 1984). It appears that before interactive video can be used effectively as an alternative or supplement to traditional instruction validation must take place.

Summary

The intra-task sequence of throwing has been well documented for stability across longitudinal studies (discussed in Chapter 1) and used in the evaluation of physical education program impact (Graham & Metzler, 1985; Reuschlein & Vogel, 1984). Conceptually, this sequence can be viewed from a total body configuration approach or a components approach. If it assumed that teaching involves the ability to help children learn "how" to perform a skill (Brown, 1982), then the conceptualization of the intra-task sequence becomes important when considering the design of training programs.

The literature appears to support the use of the total body configuration approach since it has been used in at least two large scale studies of program impact. In the MEAP & TECPEP projects, a mature pattern of throwing was defined as consisting of four aspects of body action: side orientation, arm extension, weight transfer, and sequential hip to shoulder rotation. When considering the design of training programs, it seems reasonable to assume that teachers can learn to accurately identify these aspects since they have been reliably assessed in field studies. For the purpose of this investigation, the intra-task

skill sequence will be conceptualized from a total body configuration approach.

Research in skill analysis has revealed that physical education teachers do not possess a special facility for skill analysis (Biscan & Hoffman, 1976). In fact, experience may be one variable affecting this ability. Hoffman and Sembiente's (1977) study of softball players and trained physical education teachers illustrates this point. When considered in light of Barrett's (1979a) conclusion that skill in analysis involves planning, it could be argued that planning what to look for and where to look may serve as a form of experience.

Another type of experience found in the literature is the extent of exposure to the performance under analysis. Bayless (1981) found that subjects exposed to only one visual exposure of a prototypic skill performed superior to those receiving audio-visual and more exposures. Although this finding has strong implications for developing superior detection skills, its application is, at best, problematic. Since Bayless (1981) investigated physical education teachers' ability to detect errors in the volleyball serve, spike and block, this finding can not be generalized to the skill of throwing. Therefore, the extent of exposure to

visual stimuli will follow the protocol outlined in the MEAP & TECPEP projects (see Graham & Bos, 1986; Reuschlein & Vogel, 1984).

Recently, videotaped instruction has been found to be a viable method of developing skill in observational analysis (Morrison & Harrison, 1985) however the use of this technology is not new. Other studies (Allen, 1967; Legee & Apser, 1972; Nias, 1979; Mertz, 1972; Orme, McDonald, & Allen, 1966; Stuart (1979), support its efficacy and identify two important design considerations.

First, the findings from Orme, McDonald, & Allen (1966) suggest that it may be appropriate to use both written and visual models in training. More recently, Laurillard's advocacy of learner control (1984) implies that learners may choose to read about the information or be shown video examples of each point to learned. Therefore, in the design of the interactive video training program, learners will be given control over these options. A second consideration is that a more desirable effect may be obtained from using positive models (Allen, 1967). In the MEAP project (see MEAP, Physical Education Film Training Manual , 1984-85 for a complete description of each aspect) training involved the use of a model sample in which correct performance was

demonstrated. The application of the use of a model sample will be used in the interactive training program.

There is little empirical evidence to support interactive video training although it has been found to be as effective as traditional types of training methods (Thorkildsen & Freidman, 1986). Yet despite the paucity of support, its application is repeatedly endorsed as a cost-effective method of training (see Floyd & Floyd, 1982 for case studies). Hon's (1982) claim that interactive video training in cardiopulmonary resuscitation provided an opportunity for greater numbers to receive training without increasing the number of instructors is exemplar of such endorsements. However, before interactive video can be used effectively as an alternative or supplement to traditional instruction validation must take place.

Chapter 3

Methods and Materials

Subjects

Twenty-one undergraduate (n=19) and graduate (n=2) students enrolled in an intact elementary physical education methods class agreed to participate in this investigation. Three additional students not enrolled in the methods class (2 undergraduate and 1 graduate) also agreed to participate. The subjects' majors were predominately outside of physical education (n=19). Fourteen subjects indicated prior experience or course work may have aided their participation in this project.

Equipment

The materials used in this investigation included an Apple IIe computer with enhanced memory and color monitor equipped with audio. Two Panasonic 1/2" video tape recorders were used. A Panasonic 6200 VCR was equipped with a remote jack to accommodate interactive video control. The second VCR was equipped with variable speed playback control. A 21" Panasonic color monitor was used for testing and training. The BCD 'Instructor' authoring package was used to develop the interactive training lesson. Contents of this package included the BCD interface card placed in slot #4 of the computer, the computer program which

generated the interactive lesson and a user's manual. Three video tapes were produced by the investigator.

Procedures

The execution of this research took place in several phases: design, production, testing, intervention and data analysis. The procedures executed in each phase will be summarized with detailed descriptions provided in the appendices.

Design phase

Two different methods for teaching qualitative movement analysis (i.e., interactive video training and videotape training) were developed. Each involved the structuring of information and the design of different methods of

presentation. Both methods will be discussed.

The selection of information to be presented in the training of qualitative movement analysis.

Four standards associated with the mature performance of the overhand throw were adopted from the Michigan Educational Assessment Project (1984) and identified as the criteria for making qualitative assessments. Each standard was further defined via checklists developed by the investigator. These checklists were based on those developed by Graham and Bos (1985) and Kelly and Walkley (1986). Definitions of each standard were included in the checklists, as well as information cuing the subject to the specific body parts that should be observed during the performance. These checklists were used in both the interactive video training and videotape training methods and are presented in Tables 1, 2, 3 and 4.

The conceptual design of the interactive video training intervention.

The Virginia Tech Interactive Video Motor Assessment System (VTIVMAS) was developed by the investigator for the purpose of qualitative movement analysis training. This program consisted of a computer lesson stored on a floppy disk, a 1/2" video tape containing samples of throwing and

Table 1: Side Orientation

STANDARD 1

SIDE ORIENTATION

SIDE ORIENTATION PARALLEL TO THE INTENDED DIRECTION OF THE THROW.

--Side orientation means that the feet will be parallel to the target during the wind-up.

The head should be turned so the thrower is looking over the shoulder.

--The key to analyzing side orientation lies in a clear definition of the word **parallel**.

As the ball moves backward (wind-up), the rear foot should be parallel to the direction of the throw.

--When the front foot is pointing in another direction, side orientation can be present.

Watch to see if the thrower is looking over the shoulder facing the target. The front foot must be opposite the throwing hand.

To observe side orientation:

1. Watch the feet. Are they parallel to the target? Is the front foot opposite the throwing hand?

2. Watch the head and shoulders. Is the thrower looking over the shoulder facing the target?

3. Watch the ball as it moves backward. This is when you should make your decision.

Table 2: Arm Extension

STANDARD 2

ARM EXTENSION

NEAR COMPLETE EXTENSION OF THE THROWING ARM TO THE REAR

DURING THE WIND-UP.

--Arm extension means that the throwing arm will be almost straight during the wind-up phase.

--If the thrower is side oriented then arm extension can occur. Focus on the elbow as the ball approaches the rear during the wind-up.

--Arm extension must be identified before the ball starts forward.

To observe arm extension:

1. Watch the throwing arm as it moves backward during the wind-up. Is the ball moving backward?
2. Focus on the elbow. Is it nearly straight before the ball begins to move forward?
3. The arm should never be completely straight. The angle at the elbow is nearly straight when the elbow joint approaches 150 degrees.

Table 3: Weight Transfer

STANDARD 3

WEIGHT TRANSFER

**WEIGHT TRANSFER TO THE FOOT OPPOSITE THE THROWING ARM AS THE
THROWING HAND PASSES ABOVE THE SHOULDER.**

--Weight transfer means there is a smooth shift of the body weight to the front foot. This must occur as the throw is being executed. It may include a step to the foot opposite the throwing arm.

--The rear foot must move in some way. It may be lifted at the heel or drug in the direction of the target.

--Opposition must occur prior to the forward motion of the ball for weight transfer to be present. The rear foot moved in the direction of the throw constitutes weight transfer.

To observe weight transfer:

1. Watch the front foot. Is there opposition? When there is no opposition weight transfer can not be present.

2. Watch the rear foot as the ball moves forward. Does it move in the direction of the target?

3. Watch the ball. Is it moving forward? Any action where the rear foot is lifted from its position is considered weight transfer if the ball is moving forward.

Table 4: Sequential Hip and Shoulder Rotation

STANDARD 4

STANDARD MARKED SEQUENTIAL HIP AND SHOULDER ROTATION

--Sequential hip/shoulder rotation means there is an uncoiling of the trunk initiated by the hips and followed by the shoulders. It occurs as the weight is shifted to the front foot.

--The hips should rotate past the target. When there is no opposition hip/shoulder rotation can not be present.

--If the rotation of the hip and shoulder occur at the same time, look for the forearm to lag behind the hips. If this occurs, rotation is present.

To observe hip/shoulder rotation:

1. Watch the front foot. Is the weight shifting to the front foot? The hips will begin to turn in the direction of the throw.
2. Watch for the throwing arm to lag behind the hips. Are the hips and shoulders moving at the same time?
3. Watch for the completion of the throwing motion. Are the hips turned past the direction of the target?

a training manual. The program was designed to provide the subject maximum control over selected information and video scenes.

The computer lesson, entitled "Overhand Throw," was generated using the BCD 'Instructor' authoring system and contained 92 pages of programming. Thirty-seven pages were video taped scenes that could be accessed by the subject. The entire program was divided into 4 modules to help the subject understand the operation of the program as shown in Figure 1a.

The program began with an introductory video scene stating the objective of the lesson. This was followed by the "Main Menu" selections identifying the 4 modules. Each module was designed to teach one standard to the subject. For example, module 1 was instruction for side orientation. Figure 1a illustrates the "Main Menu" selection page.

Each module was broken down into 2 modes: a video mode and a text mode. The video mode allowed the subject to view selected video scenes illustrating correct and incorrect performances of the standards. The text mode allowed the subject to review definitions of each standard without viewing the video scenes. The two modes contained different information (e.g. text mode definitions were stated

differently from the video mode). Each mode contained an "Options menu". This menu page provided the subject with 5 options for instruction. Figures 1b and 1c illustrate the "Options Menu" selection for each mode.

Selections made from the "Options Menu" in the video mode were: 1. a definition, 2. a demonstration, 3. to see and assess a trial, 4. to change to the text mode, and 5. to quit. A definition (option 1) enabled the subject to view either a still picture (with audio definition) or a close-up of the body part to be observed. By selecting option 2, subjects could see a demonstration of the correct performance of the standard (demonstrations were identical for each module). Option 3 made practice available. Here the subject was shown three identical samples of the overhand throw. Four different Performances were identified for random selection by the computer. After viewing the samples, the subject was asked if the standard was present during the performance. A correct response returned the subject to the "Options Menu" for additional selections. An incorrect response branched the subject to another part of the program for remediation. Here the subject was given the choice to read and view primary information or secondary information. Primary information

restated the definition of the standard and was illustrated by correct and incorrect performances. Secondary information identified the body parts that should be observed during the performance. Correct and incorrect performances were shown. Each information block branched to the options menu upon completion. Options to change modes (4) and to end the program (5) were also available.

The text mode "Options Menu" was similar to that of the video mode with minor differences. Selecting option 1 provided the subject with 2 pages of written information defining the standard. A demonstration, option 2, could be chosen however practice (option 3) was only available in the video mode due to a limitation inherent in the BCD authoring package. Options 4 and 5 were also available.

The conceptual design of the videotaped training intervention.

Qualitative movement analysis training in the videotaped group was based on the design of the Michigan Educational Assessment Project film training manual (1984-85). In this system a 16mm film and training manual were developed for self-instruction. It alternated between reading from the manual and viewing selected video samples.

The training developed by the investigator followed the same format of alternation between reading and viewing with the following changes.

First, the training was given under the direction of the investigator rather than as a self-instructional package. Second, unlimited practice opportunities were available and based on the stated needs of the subjects, as well as the discession of the investigator. This method will be discussed more thoroughly in the intervention phase of the procedures.

Production phase

The next step in the execution of this research involved the production of materials to be used in the remaining phases. These included the "Overhand Throw" lesson, 3 video tapes and written materials.

The production of the Overhand Throw Lesson.

Production of the "Overhand Throw Lesson" involved several processes. The contents and sequence of each page of information was entered onto a "page contents form". This form (see Table 5) identified the necessary commands for programming using the authoring package. This information was transferred to the floppy disk using the BCD 'Instructor' program (see Appendix A).

Table 5: Page Content Form

Lesson Name:

Page Number	Page Type	Page Content	Video Begin	Video End	Branch to Page #	Correct Response #	Score? (Y/N)	Computer Ref. (Y/N)

Next, the video tape entitled "VTIVMAS, Overhand Throw Lesson" (to be discussed in the next section) was subjected to a process called absolute addressing. This process places a digital code on one of the audio channels of the video tape. This process is identical to those used in video studios for accurate frame editing.

A tape log was created by identifying the location of each of the 37 video scenes as shown in Table 6. Marking the "in point" (where the scene would begin) and the "out point" (where the scene would end) for each scene let the computer program know the exact location of each scene. The reader is referred to the BCD users manual (1984) for a detailed description of these processes.

The process of videotaping.

Three video tapes were produced: one for each training method and one for testing. The video tapes produced for the two training methods were shot during the same videotaping session. A local elementary school agreed to participate in the taping session (see Appendix B for approval/request forms). Videotaping of 3rd graders was contingent upon the return of informed consent forms (see Appendix C).

Table 6: Video Tape Log for Overhand Throw Lesson

Scene #	In	Out	Duration	Label
1	00:00:38:24	00:01:03:12	00:00:24:18	INTRO
2	00:01:07:04	00:01:18:01	00:00:10:27	FFS1
3	00:01:21:13	00:01:35:13	00:00:14:00	CUS1
4	00:01:38:05	00:01:49:17	00:00:11:12	MODELS1
5	00:01:52:16	00:02:03:22	00:00:11:06	RND1A
6	00:02:07:02	00:02:17:27	00:00:10:25	RND1B
7	00:02:20:20	00:02:36:08	00:00:15:18	RND1C
8	00:02:39:06	00:02:49:06	00:00:10:00	RND1D
9	00:02:52:19	00:03:45:03	00:00:52:14	PIS1
10	00:03:48:09	00:04:27:10	00:00:39:01	SIS1
11	00:05:05:18	00:05:18:06	00:00:12:18	FFS2
12	00:05:21:18	00:05:35:14	00:00:13:26	CUS2
13	00:05:37:12	00:05:45:06	00:00:07:24	MODELS2
14	00:05:47:22	00:06:00:10	00:00:12:18	RND2A
15	00:06:03:22	00:06:12:11	00:00:08:19	RND2B
16	00:06:17:09	00:06:29:08	00:00:11:29	RND2C
17	00:06:34:01	00:06:45:13	00:00:11:12	RND2D
18	00:06:49:07	00:07:50:18	00:01:01:11	PIS2
19	00:07:53:26	00:08:38:16	00:00:44:20	SIS2
20	00:08:41:13	00:08:52:10	00:00:10:27	FFS3
21	00:08:55:07	00:09:09:09	00:00:14:02	CUS3
22	00:09:12:07	00:09:21:08	00:00:09:01	MODELS3
23	00:09:25:10	00:09:37:18	00:00:12:08	RND3A
24	00:09:41:08	00:09:50:15	00:00:09:07	RND3B
25	00:09:53:17	00:10:05:00	00:00:11:13	RND3C
26	00:10:07:28	00:10:16:27	00:00:08:29	RND3D
27	00:10:20:13	00:11:31:02	00:01:10:19	PIS3
28	00:11:34:09	00:12:31:05	00:00:56:26	SIS3
29	00:12:34:15	00:12:45:28	00:00:11:13	FFS4
30	00:12:49:13	00:13:03:17	00:00:14:04	CUS4
31	00:13:06:15	00:15:24:04	00:00:17:19	MODELS4
32	00:13:27:14	00:13:35:03	00:00:07:19	RND4A
33	00:13:38:04	00:13:44:27	00:00:06:23	RND4B
34	00:13:48:04	00:13:59:13	00:00:11:09	RND4C
35	00:14:02:16	00:14:11:29	00:00:09:13	RND4D
36	00:14:15:04	00:14:59:08	00:00:44:04	PIS4
37	00:15:02:19	00:15:38:06	00:00:35:17	SIS4

Twenty-two 3rd graders were requested to throw forcefully and accurately using the overhand throwing motion. Three attempts by each child to perform the throw were taped in a wide shot to illustrate the total performance. Three additional attempts were shot close-up to record the body parts to be viewed in each standard. The throw was executed from a distance of 40'. No verbal feedback was given.

The taping was conducted by a professional videographer from a local television station using 3/4" video format while the investigator and physical education teacher supervised the children. The camera, recorder and audio equipment were borrowed from a local production agency.

The third video tape used in the testing phase was produced in conjunction with a major research project conducted at Virginia Tech by the faculty and graduate students in physical education pedagogy: The Teacher Effectiveness in Children's Physical Education Programs project (TECPEP). One aspect of TECPEP involved videotaping the of performances of the overhand throw by 1st, 3rd and 5th grade students in eight different schools. One video tape of 3rd graders (one class from one school) was selected to be used in the testing procedure.

The process of coding video taped performances.

Each of the video tapes were analyzed (coded) by the investigator for demonstration of the four qualitative standards. A "1" was coded if the standard was demonstrated and a "0" coded if not. The tapes were later recoded by the investigator to obtain intra-rater agreement reliability. Only those performances in agreement were selected to be used in the final tape productions.

Determining the reliability of the coding process.

The investigator was trained in conjunction with the TECPEP project based on the checklist developed by Graham and Bos (1985) as shown in Table 7. In addition, a criterion test was passed with acceptable reliability coefficients. All overhand throw performances in the TECPEP (n=1638) project were analyzed by the investigator with inter-rater agreements in excess of .90 for each of the four standards. Performances analyzed in this investigation produced intra-rater reliability scores in excess of .80 for each standard. Reliability coefficients were calculated using a percent agreement procedure in which the number of agreements were divided by the total of agreements and disagreements to obtain a percentage of agreement.

Table 7: TECPEP OVERHAND THROW OBSERVATION GUIDELINES

ALL GRADES

1. SIDE ORIENTATION PARALLEL TO THE THROW

- A. The child stands sideways to the target.
- B. The foot opposite the throwing hand is clearly the front foot, i.e. the foot closest to the target.

2. NEAR COMPLETE EXTENSION OF THE THROWING ARM TO THE REAR DURING THE WINDUP.

- A. The extension needs to occur during the windup, i.e. before the arm starts forward.
- B. The arm is never completely straight; when it is, the throw is often a fling rather than a throw and therefore is coded a zero (0).

3. WEIGHT TRANSFERS TO THE FOOT OPPOSITE THE THROWING ARM AS THE THROWING HAND PASSES ABOVE THE SHOULDER.

- A. The rear foot is:
 - 1. On the toe with the heel clearly off the ground OR
 - 2. The rear foot (actually the toe) drags towards the target OR
 - 3. The rear foot is lifted and a step is made in the direction of the target.
- B. There is opposition, i.e. the front foot is the one opposite the throwing arm.

4. MARKED SEQUENTIAL HIP AND SHOULDER ROTATION

- A. The hip begins rotation before the shoulder; about the time the front foot is planted on the ground.
- B. The sequential rotation is clear, i.e. the hip and shoulders don't rotate as a single unit, but in sequence.
- C. When there is no opposition, there cannot be proper sequential rotation.

11-11-86

Note. From Teacher Effectiveness in Children's Physical Education Programs.
Unpublished guidelines.

The process of editing the coded videotaped performances.

The video tape produced for the interactive training method was professionally edited in 3/4" format. The completed video tape consisted of 1 introductory scene, 4 still pictures, 4 close-ups, 4 model samples, 16 randomly accessed samples, and 8 remediation samples for primary and secondary information (4 each). The contents were edited in a linear fashion to prevent excessive tape rewinding.

The process of dubbing the videotaped performances.

The video tape for the interactive training method was professionally dubbed (transferred) to 1/2" format. The investigator made a 1/2" dub of the testing tape using specialized equipment to enhance the video quality. Approximately 25 seconds of video defining the standards was dubbed on the tape. Three identical samples of the performances were dubbed for a total of 14 performances. Two performances were eliminated from the testing tape because the entire performance of the throw was not in full view. Approximately 5 seconds of "black" was dubbed between performances.

The tape produced for the videotaped training method was also professionally dubbed. The 3/4" tape

containing the original performances of the 22 3rd graders performing the overhand throw was dubbed to 1/2" format. No close-ups were dubbed. The completed tape consisted of 66 samples of the overhand throw.

Preparing additional written materials.

The investigator developed the following written materials. A 25 page training manual was produced for use in conjunction with the interactive video training method (see Appendix D). The manual describes the procedures for using VTIVMAS.

Four checklists and a tape log were produced for use in conjunction with the videotaped training method (see Appendix E for written materials produced for the teacher training). The checklists presented primary and secondary information for the subjects to refer to during training. A tape log was produced to aid the investigator in locating the appropriate performances during the videotaped training session.

A testing manual was produced for use during the testing phase of the investigation (see Appendix F). This manual describes the procedures to be followed while administering both the pretest and posttest. A 7 page test booklet was produced to aid the subjects during testing (see Appendix G).

Testing phase

The pretest was administered on two separate occasions. Those students enrolled in the physical education methods class were tested on one day. Subjects absent from class on the testing date and the 3 volunteers not enrolled in the class were tested later. The procedures outlined in the testing manual were followed.

The posttest was administered similarly approximately one week from the training intervention. Students enrolled in the methods class were tested one day followed by those who were absent and the volunteers on the next day. Again, outlined procedures were followed.

The procedure for counterbalancing the order of test question presentation.

The order of pretest and post test questions (n=56 each) were counterbalanced based on a list of random numbers. The subjects were shown 14 samples of the overhand throw in which they were to identify only one qualitative standard during each performance (i. e., questions 1-14). The video tape was rewound to the beginning and the same 14 samples were presented. A different standard was to be identified and this process was repeated until each sample had been analyzed for each of the four qualitative standards

(see appendix E for question order). A different order was presented in the posttest.

Four samples were discarded due to lack of agreement by the investigator which reduced the score from 56 to 52 possible points on either test. A total of 13 samples were analyzed for side orientation, 13 for arm extension, 14 for weight transfer and 12 for hip/shoulder rotation.

The procedure for assigning subjects to treatment conditions.

Pretest scores were matched in order to make group assignments to the interactive video training or videotaped training methods. Subjects absent on the initial pretest date and the 3 volunteers were assigned to the no treatment group. Table 8 illustrates the matched pretest scores of the eight subjects assigned to each of the three groups.

Intervention phase

Subjects in this investigation were randomly assigned to one of three treatment conditions. They were: interactive video training, videotaped training, and no training. Each intervention technique will be discussed.

Table 8: Matched Pretest Scores and Treatment Assignments

Interactive training (n=8)	Videotaped training (n=8)	No Training (n=8)
28	29	32
28	30	34
32	30	35
32	31	35
32	32	36
35	36	39
36	27	42
39	42	44
M=32.75	33.38	36.75
SD=3.8	4.5	3.7

The procedures for the interactive video training group.

Eight subjects were assigned to this treatment condition. Each subject was requested to identify a two hour block of time (outside regular class time) to participate in the training. In addition, they were allowed to miss one regularly scheduled day of class (the day scheduled for the videotaped training intervention).

Each subject was trained individually via the interactive video method. Upon arrival, the subjects were given three items: the Overhand Throw Lesson stored on the floppy disk, the VTIVMAS video tape and the Interactive Video Training Manual. The subjects were told to learn the four qualitative standards. They were instructed to use as much or as little time they felt was necessary to accurately identify the standards. The investigator informed the subjects that questions regarding the standards could not be answered. Questions related to the operation of VITIMAS were allowed. The training ended when the subject felt she/he had mastered the material.

It should be noted that subjects were asked to respond immediately after viewing a throwing sample in the pretest and posttest conditions. This protocol was

substantially different from the training protocol in which subjects were given unlimited response time, as well as, unlimited viewing opportunities.

The procedures for the videotaped training group.

Eight subjects were assigned to the videotaped training intervention. Training was conducted during a regularly scheduled class time (approximately 2 hours) and all subjects participated simultaneously. The subjects were told they were to learn to accurately identify the four qualitative standards associated with the mature performance of the overhand throw.

The checklist describing side orientation was passed out to each student. The investigator paraphrased the information on the checklist. Each concept was illustrated through the use of video tape stop-action and variable speed playback. Subjects were exposed to correct and incorrect performances of the standards. Multiple practice opportunities resulted in explanations and illustrations for correct and incorrect responses. The instruction in each standard continued until the subjects felt confident of their ability. The decision to continue was made by the investigator.

The same process was executed for each of the four qualitative standards. A short break was taken following

the instruction of the first two standards. Subjects were encouraged to ask questions and were also questioned regarding responses made during the practice assessments.

The procedures for the no treatment group.

Eight subjects were assigned to the no treatment intervention. These subjects were not exposed to any intervention training during this investigation. Subjects were not told the purpose of the investigation and participated only in the testing phase.

Data Analysis

The critical question under investigation in this study was whether interactive video was an effective method of qualitative movement analysis training for throwing. The effectiveness of the interactive and videotape training strategies were determined by the test scores of their subjects in comparison with those of a control group that did not receive instruction. In order to answer the question, an analysis of covariance (ANCOVA) was used to evaluate the effectiveness in which performance pretest scores served as the covariate.

It was anticipated that analytic performance would be enhanced for those as a result of their respective training. Consequently, Duncan's multiple range test was performed to

identify which groups, if any, were significantly different.

Pilot Study

A pilot study was conducted during the Fall quarter of 1985 and involved the participation of 8 physical education majors enrolled in an elementary methods class. The purpose was to develop the optimal conditions for data collection. The investigator became familiar with equipment, procedures and conditions. Results revealed several problems with the interactive video system. In addition, it was evident that the development of manuals would aid in the data collection process.

Chapter 4

Results of the Study

Subjects' scores on the pretest and posttest were computed by subtracting the number of incorrect responses from the total number of responses possible. Each test (pre and post) contained 56 questions, of which four were eliminated due to the lack of coder agreement. As a result, the total score that could be obtained on each test was 52 points. Table 9 includes the means and standard deviations for each group on the pretest and posttest. It should be noted that the procedure for matching did not generate equivalent groups (see Table 8). However given this limitation, the no training group had the highest pretest mean prior to intervention. Theoretically, this should have made it more difficult to obtain significant results in favor of the treatment conditions.

Scores were analyzed using an analysis of covariance (ANCOVA) in which pretest scores served as covariates. When calculated, the results indicated that the model was significant ($F_{2,1}=11.35, P < .01$). Table 10 contains the summary from this analysis.

Visual inspection of the means (see Table 9) shows that the no training group scores did not change from the pretest to posttest. It is speculated that subjects in this group

Table 9: Mean and Standard Deviation by Groups

	Pre		Post	
	M	SD	M	SD
Interactive training	32.75	3.8	41.12	2.5
Videotape training	33.37	4.5	39.87	2.5
No Training	36.75	3.7	36.75	3.0

Table 10: ANCOVA Summary

Source	DF	SS	F value	PR > F
Group	2	121.59	11.35	.0005*
Pretest	1	46.13	8.61	.0082

* significant .01

formed some type of strategy for identifying the qualitative standards and implemented it consistently. No change in this mean further suggests that performance was enhanced by the training conditions.

It was expected that the videotape training group would experience a training effect since this method of instruction has been found to improve performance of this skill (Morrison & Harrison, 1985). Overall, the mean performance in this group was improved by 6.5 points (see Table 9). The interactive video group experienced the greatest improvement with an 8 point increase. It is speculated that the slightly higher posttest mean (see Table 9) can be explained by the difference in training procedures. Subjects in the interactive training group experienced approximately 2 hours of individualized instruction. These subjects were given an opportunity to learn those aspects of a mature throw based on their individual needs. In addition, interaction was inevitable. When the interactive video program asked a question, the system waited for the subject to respond before continuing with instruction. In the videotaped training group, interaction was highly encouraged however it was limited to those who chose to respond. The increase in the posttest

means suggests that training, whether videotaped or interactive video instruction, may improve the ability to accurately identify the qualitative aspects of throwing.

Inspection of the standard deviations (see Table 9) provides another indication that training was effective. These figures illustrate the variance among the subjects within each group. This variability illustrates that subjects implemented their own strategy for identifying the standards but they may not have known what to look for. After training, the interactive video and videotaped groups appeared to make identifications more consistently.

Duncan's multiple range test was performed to identify which groups differed following training. Table 11 illustrates that both training conditions resulted in performance superior to that of the no training group. Clearly, this finding suggests that knowing what to look for and where to look is an effective observational strategy.

Another important finding was that the interactive training method did not emerge as superior to the videotape training. This finding is consistent with Thorkildsen & Friedman's (1986) conclusion that interactive video is not

Table 11: Duncan's Multiple Range Test Summary

Groups	N	Posttest Duncan Grouping	
		Mean	
Interactive training	8	41.12	A
Videotaped training	8	39.87	A
No training	8	36.75	B

Groups with the same letter are not significantly different

superior to traditional methods of instruction. Despite this, it appears that interactive video training is an effective method of teaching qualitative movement analysis for throwing.

Chapter 5

Summary and Conclusions

The most recent advancement in educational technology is the application of interactive video to instruction. The capabilities of the microcomputer are combined with those of videotape playback to surpass the effectiveness of each technology alone. It is believed that this type of instruction might be applicable in physical education.

The purpose of this study was to develop and test the effectiveness of such a system in teaching preservice teachers to detect performance errors in the overhand throw. One main element of the program was the identification of performance errors. Subjects were to identify four qualitative standards associated with the mature performance of the overhand throw. It was apparent from the improved posttest scores that the subjects were able to identify these standards after minimal instruction. Another design element was a strategy of teaching subjects where to look to identify the standard.

The findings from this investigation imply that interactive video offers alternatives to traditional classroom instructional methods. The most obvious implication is that more students may receive training

in qualitative movement analysis without increasing the number of instructors. In fact, to operate the system students only need the power source (i.e., the computer and videotape recorder), the lesson (computer disk), and a manual describing how the system works.

A second implication, closely related to the previous one, is that instruction becomes highly interactive and individualized, thereby creating the ideal learning environment. The sequence and organization of the content can be planned to include elaborate activities with immediate feedback and remediation. In addition, a variety of levels of information may be presented which correspond with the various entry levels that can be expected from the target student population. More importantly, these design features become invisible to the student who is allowed to select the content and sequence that the instruction will follow.

While there is conclusive evidence that qualitative movement analysis can be taught via interactive video instruction, there are costly economic and time commitments. The fact that implementation involves the purchasing of expensive equipment may eliminate its use in many programs. There is an advantage to using an interactive system that uses video tape as opposed to

videodisk (the more sophisticated system). First, it is possible that a computer and videocassette recorder already exist in some programs, not to mention the availability of videotaping equipment, leaving only the interface card and authoring language program left to purchase. Second, using an authoring language requires little, if any, programming skills. Also, these programs can be applied to videotapes that already exist. Using these tapes can eliminate expensive videotaping and editing costs that are inherent in videodisk systems. Even then, interactive video instruction requires an adequate budget.

Assuming there is budgetary support for the application of this method of instruction, there are additional time commitments. The most critical feature determining the effectiveness of any instructional program is its design. This involves planning, production, field testing, and evaluation, all of which are time consuming endeavors. It is recommended that the decision to use this technology be made knowing these advantages and disadvantages.

Obviously, the implementation of interactive video instruction is more than a matter of simply knowing the

correct buttons to push. To offer this technology as a panacea over traditional methods would be premature.

Although it was beyond the scope of this study to determine which standards were more readily identified, several interesting questions are left unanswered. Would weight transfer be easier to detect than the other standards because it could be identified by its name alone? Did the training improve the ability to detect the performance of all standards equally or were there standards that did not improve after training? Did the subjects actually change where they looked to identify the standards or was the improved performance the result of increased knowledge about the standard? Would more instructional time result in more competent error detection skills? Are there other designs that would produce superior detection skills? Although the answers to these questions would contribute to understanding the effects of this type of instruction, evaluation would be incomplete without considering its costs. This line of inquiry would allow one to select the method (interactive or traditional) that provided the best educational benefits and was most economical.

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Appendix A: Figures

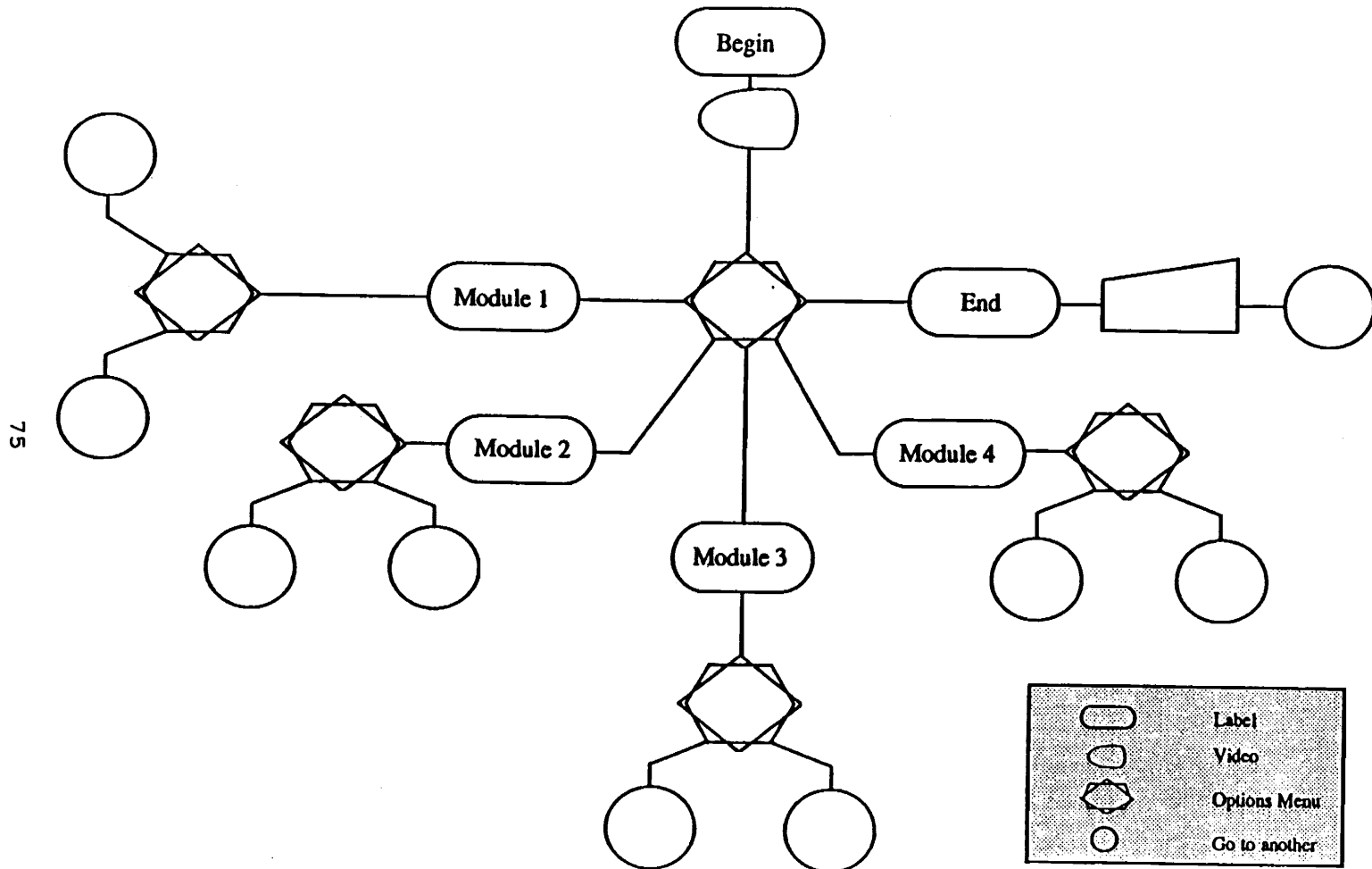


Figure 1a: Interactive video main menu selections.

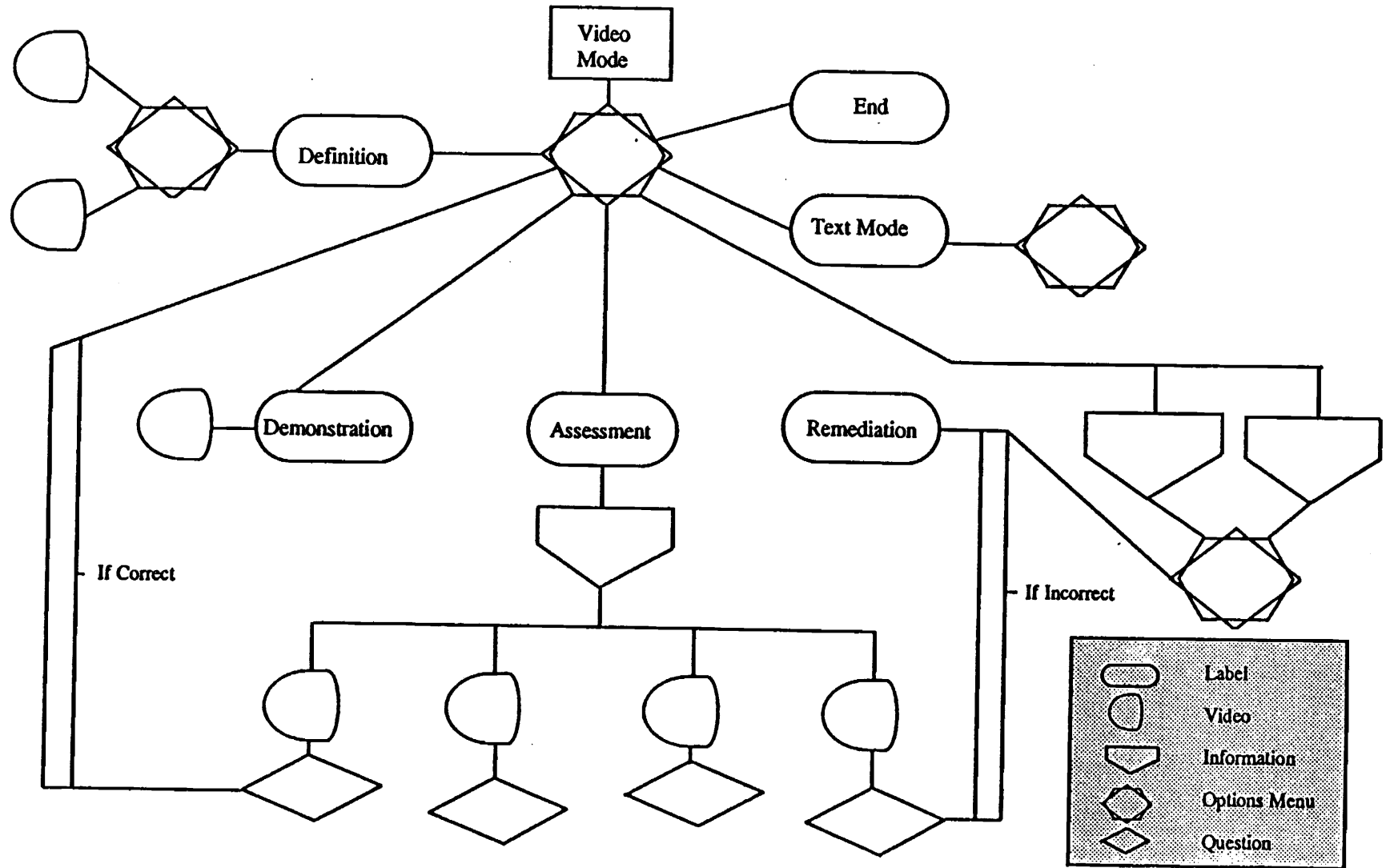


Figure 1b: Interactive video option menu selection for the video mode.

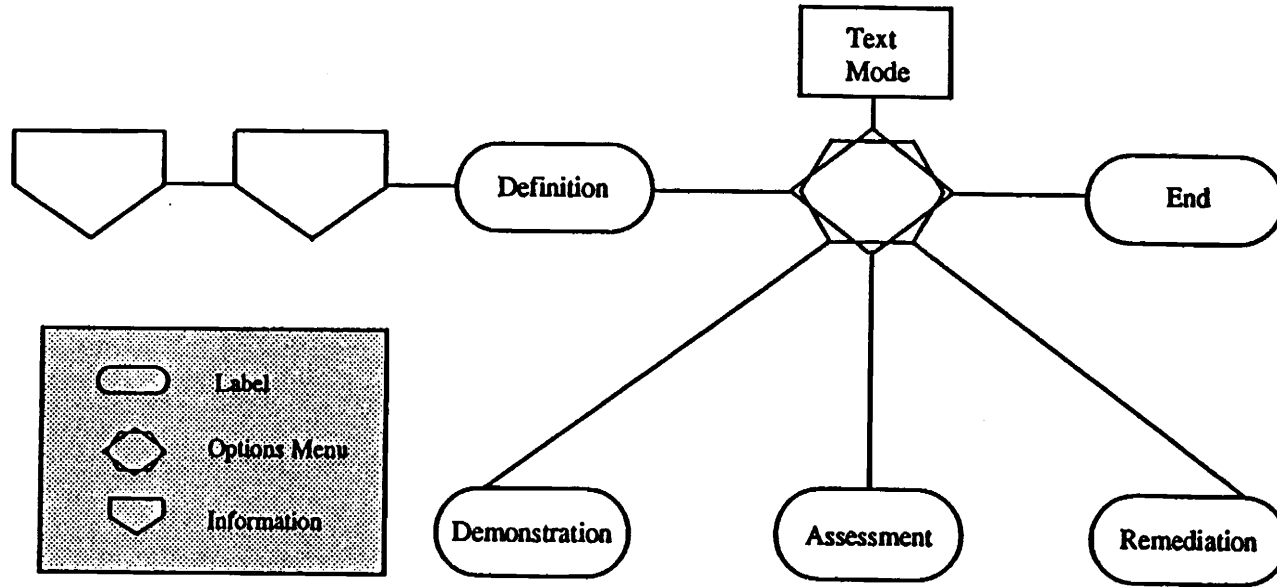


Figure 1c: Interactive video option menu selection for the text mode.

Appendix B: Overhand Throw Lesson

Overhand Throw Lesson - Computer Printout

PAGE #1 V PAGE

NEXT VTR SEGMENTS 1 TO 1

THIS BRANCHES TO #2

PAGE #2 M PAGE

<<MAIN MENU>> WHERE WOULD YOU BEGIN?

1. STANDARD #1 - SIDE ORIENTATION

VIDEO 000 TO 000. NEXT PAGE #003

2. STANDARD #2 - ARM EXTENSION

VIDEO 000 TO 000. NEXT PAGE #026

3. STANDARD #3 - WEIGHT TRANSFER

VIDEO 000 TO 000. NEXT PAGE #048

4. STANDARD #4 - HIP/SHOULDER ROTATION

VIDEO 000 TO 000. NEXT PAGE #070

5. QUIT

VIDEO 000 TO 000. NEXT PAGE #092

CORRECT ANSWERS ARE 1,2,3,4,5

PAGE #3 M PAGE

* * * SIDE ORIENTATION * * *

1. YOU MAY CHOOSE TO SEE VIDEO

VIDEO 000 TO 000. NEXT PAGE #004

2. YOU MAY CHOOSE TO READ TEXT

VIDEO 000 TO 000. NEXT PAGE #023

CORRECT ANSWERS ARE 1,2

PAGE #4 M PAGE

<VIDEO> WHAT WOULD YOU LIKE NEXT?

1. A DEFINITION

VIDEO 000 TO 000. NEXT PAGE #005

2. A DEMONSTRATION

VIDEO 000 TO 000. NEXT PAGE #008

3. TO SEE AND ASSESS A TRIAL

VIDEO 000 TO 000. NEXT PAGE #009

4. CHANGE TO TEXT MODE

VIDEO 000 TO 000. NEXT PAGE #023

5. RETURN TO THE MAIN MENU

VIDEO 000 TO 000. NEXT PAGE #002

6. QUIT

VIDEO 000 TO 000. NEXT PAGE #092 CORRECT ANSWERS ARE
1,2,3,4,5,6

PAGE #5 M PAGE

<VIDEO> WHAT WOULD YOU LIKE TO SEE? 1. A STILL PICTURE

VIDEO 000 TO 000. NEXT PAGE #006 2. A CLOSE-UP

VIDEO 000 TO 000. NEXT PAGE #007 CORRECT ANSWERS ARE

1,2

PAGE #6 V PAGE

NEXT VTR SEGMENTS 2 TO 2

THIS BRANCHES TO #4

PAGE #7 V PAGE

NEXT VTR SEGMENTS 3 TO 3

THIS BRANCHES TO #4

PAGE #8 V PAGE

NEXT VTR SEGMENTS 4 TO 4

THIS BRANCHES TO #4

PAGE #9 I PAGE

YOU ARE ABOUT TO SEE THREE IDENTICAL SAMPLES OF THE
OVERHAND THROW. YOU WILL BE ASKED TO DETERMINE IF THE
STANDARD WAS PRESENT IN THE PERFORMANCE.

REMEMBER ---

LOOK ONLY FOR SIDE ORIENTATION.

THIS BRANCHES TO #10

RANDOM BRANCH PAGE #11

RANDOM BRANCH PAGE #12

RANDOM BRANCH PAGE #13

RANDOM BRANCH PAGE #14

PAGE #11 V PAGE

NEXT VTR SEGMENTS 5 TO 5
THIS BRANCHES TO #15

PAGE #12 V PAGE

NEXT VTR SEGMENTS 6 TO 6
THIS BRANCHES TO #16

PAGE #13 V PAGE

NEXT VTR SEGMENTS 7 TO 7
THIS BRANCHES TO #17

PAGE #14 V PAGE

NEXT VTR SEGMENTS 8 TO 8
THIS BRANCHES TO #18

PAGE #15 K PAGE

WAS SIDE ORIENTATION PRESENT DURING THIS PERFORMANCE?

YES

NO VTR SEGMENTS
THIS RESPONSE BRANCHES TO 4

NO

NO VTR SEGMENTS
THIS RESPONSE BRANCHES TO 19

NO KEYWORD

NO VTR SEGMENTS
THIS RESPONSE BRANCHES TO 19

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 19

CORRECT ANSWER IS #1

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #16 K PAGE

WAS SIDE ORIENTATION PRESENT DURING THIS PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 19

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 4

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 19

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 19

CORRECT ANSWER IS #2

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #17 K PAGE

WAS SIDE ORIENTATION PRESENT DURING THIS PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 19

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 4

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 19

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 19

CORRECT ANSWER IS #2

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #18 K PAGE

WAS SIDE ORIENTATION PRESENT DURING THIS PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 4

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 19

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 19

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 19

CORRECT ANSWER IS #1

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #19 M PAGE

WHAT WOULD YOU LIKE NEXT?

1. MORE INFO ABOUT THE STANDARD

VIDEO 000 TO 000. NEXT PAGE #020

2. MORE INFO ABOUT HOW TO OBSERVE

VIDEO 000 TO 000. NEXT PAGE #021

CORRECT ANSWERS ARE 1,2

PAGE #20 I PAGE

SIDE ORIENTATION MEANS THAT THE FEET WILL BE PARALLEL TO THE TARGET DURING THE WIND-UP. THE HEAD SHOULD BE TURNED SO THE THROWER IS LOOKING OVER THE SHOULDER.

WATCH THE FOLLOWING EXAMPLES WHERE SIDE ORIENTATION IS DEMONSTRATED.

NEXT VTR SEGMENTS 9 TO 9

THIS BRANCHES TO #22

PAGE #21 I PAGE

TO OBSERVE SIDE ORIENTATION...

1ST- WATCH THE FEET. ARE THEY PARALLEL TO THE TARGET? 2ND- WATCH THE HEAD & SHOULDERS. IS THE THROWER LOOKING OVER THE SHOULDER FACING THE TARGET?

3RD- WATCH THE BALL AS IT MOVES BACKWARD. THIS IS WHEN SIDE ORIENTATION SHOULD BE ANALYZED.

NEXT VTR SEGMENTS X TO X

THIS BRANCHES TO #22

PAGE #23 M PAGE

<VIDEO> WHAT WOULD #OU LIKE NEXT?

1. A DEFINITION

VIDEO 000 TO 000. NEXT PAGE #024

2. A DEMONSTRATION

VIDEO 004 TO 004. NEXT PAGE #023

3. TO SEE AND ASSESS A TRIAL

VIDEO 000 TO 000. NEXT PAGE #004

4. RETURN TO THE MAIN MENU

VIDEO 000 TO 000. NEXT PAGE #002

5. QUIT

VIDEO 000 TO 000. NEXT PAGE #092

CORRECT ANSWERS ARE 1,2,3,4,5,

PAGE #24 I PAGE

--- DEFINITION FOR STANDARD 1 ---

* * * SIDE ORIENTATION * * *

FEET ARE PARALLEL TO THE TARGET DURING THE WIND-UP. THE HEAD IS TURNED SO THE THROWER IS LOOKING OVER THE SHOULDER.

THE BALL IS MOVING BACKWARD WHICH IS CONSIDERED THE WIND-UP PHASE OF THE THROW.

NO VTR SEGMENTS

THIS BRANCHES TO #25

PAGE #25 I PAGE

THE KEY TO ANALYZING SIDE ORIENTATION LIES IN A CLEAR DEFINITION OF THE WORD PARALLEL. AS THE BALL MOVES BACKWARD THE REAR FOOT SHOULD BE PARALLEL TO THE DIRECTION OF THE THROW.

WHEN ONE FOOT IS POINTING IN ANOTHER DIRECTIONS- SIDE ORIENTATION CAN BE PRESENT. LOOK TO SEE IF THE THROWER IS LOOKING OVER THE SHOULDER FACING THE TARGET.

NO VTR SEGMENTS

THIS BRANCHES TO #23

PAGE #26 M PAGE

* * * ARM EXTENSION * * *

1. YOU MAY CHOOSE TO SEE VIDEO VIDEO 000 TO 000. NEXT
PAGE #027
2. YOU MAY CHOOSE TO READ TEXT VIDEO 000 TO 000. NEXT
PAGE #045

CORRECT ANSWERS ARE 1,2

PAGE #27 M PAGE

<VIDEO> WHAT WOULD YOU LIKE NEXT?

1. A DEFINITION
VIDEO 000 TO 000. NEXT PAGE #028
2. A DEMONSTRATION
VIDEO 000 TO 000. NEXT PAGE #031
3. TO SEE AND ASSESS A TRIAL
VIDEO 000 TO 000. NEXT PAGE #032
4. CHANGE TO TEXT MODE
VIDEO 000 TO 000. NEXT PAGE #045
5. RETURN TO THE MAIN MENU
VIDEO 000 TO 000. NEXT PAGE #002
6. QUIT
VIDEO 000 TO 000. NEXT PAGE #092 CORRECT ANSWERS ARE
1,2,3,4,5,6

PAGE #28 M PAGE

<VIDEO> WHAT WOULD YOU LIKE TO SEE? 1. A STILL PICTURE

VIDEO 000 TO 000. NEXT PAGE #029

2. A CLOSE-UP

VIDEO 000 TO 000. NEXT PAGE #030

CORRECT ANSWERS ARE 1,2

PAGE #29 V PAGE

NEXT VTR SEGMENTS 11 TO 11

THIS BRANCHES TO #27

PAGE #30 V PAGE

NEXT VTR SEGMENTS 12 TO 12

THIS BRANCHES TO #27

PAGE #31 V PAGE

NEXT VTR SEGMENTS 13 TO 13

THIS BRANCHES TO #27

PAGE #32 I PAGE

YOU ARE ABOUT TO SEE THREE IDENTICAL SAMPLES OF THE
OVERHAND THROW. YOU WILL BE ASKED TO DETERMINE IF THE
STANDARD WAS PRESENT IN THE PERFORMANCE.

REMEMBER ---

LOOK ONLY FOR ARM EXTENSION.

NO VTR SEGMENT

THIS BRANCHES TO #33

RANDOM BRANCH PAGE #34

RANDOM BRANCH PAGE #35

RANDOM BRANCH PAGE #36

RANDOM BRANCH PAGE #37

PAGE #34 V PAGE

NEXT VTR SEGMENTS 14 TO 14

THIS BRANCHES TO #38

PAGE #35 V PAGE

NEXT VTR SEGMENTS 15 TO 15

THIS BRANCHES TO #39

PAGE #36 V PAGE

NEXT VTR SEGMENTS 16 TO 16

THIS BRANCHES TO #40

PAGE #37 V PAGE

NEXT VTR SEGMENTS 17 TO 17

THIS BRANCHES TO #41

PAGE #38 K PAGE

WAS ARM EXTENSION PRESENT DURING THIS PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 42

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 27

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 42

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 42

CORRECT ANSWER IS #2

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #39 K PAGE

WAS ARM EXTENSION PRESENT DURING THIS PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 42

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 27

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 42

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 42

CORRECT ANSWER IS #2

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #40 K PAGE

WAS ARM EXTENSION PRESENT DURING THIS PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 27

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 42

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 42

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 42

CORRECT ANSWER IS #1

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #41 K PAGE

WAS ARM EXTENSION PRESENT DURING THIS PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 27

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 42

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 42

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 42

CORRECT ANSWER IS #1

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #42 M PAGE

WHAT WOULD YOU LIKE NEXT?

1. MORE INFO ABOUT THE STANDARD

VIDEO 000 TO 000. NEXT PAGE #043

2. MORE INFO ABOUT HOW TO OBSERVE

VIDEO 000 TO 000. NEXT PAGE #044

CORRECT ANSWERS ARE 1,2

PAGE #43 I PAGE

ARM EXTENSION MEANS THAT THE THROWING ARM WILL BE ALMOST STRAIGHT DURING THE WIND-UP PHASE.

WATCH THE FOLLOWING EXAMPLES WHERE ARM EXTENSION IS PRESENT.

NEXT VTR SEGMENTS 18 TO 18

THIS BRANCHES TO #22

PAGE #44 I PAGE

TO OBSERVE ARM EXTENSION...

1ST- WATCH THE THROWING ARM AS IT MOVES BACKWARD DURING THE WIND-UP. 2ND- FOCUS ON THE ELBOW. IT SHOULD BE NEARLY STRAIGHT BEFORE THE BALL MOVES FORWARD.

3RD- THE ARM SHOULD NEVER BE COMPLETELY STRAIGHT. THE ANGLE AT THE ELBOW JOINT IS NEARLY STRAIGHT WHEN IT APPROACHES 150 DEGREES.

NEXT VTR SEGMENTS 19 TO 19

THIS BRANCHES TO #22

PAGE #45 M PAGE

<TEXT> WHAT WOULD YOU LIKE NEXT? 1. A DEFINITION

VIDEO 000 TO 000. NEXT PAGE #046

2. A DEMONSTRATION

VIDEO 013 TO 013. NEXT PAGE #045

3. TO SEE AND ASSESS A TRIAL

VIDEO 000 TO 000. NEXT PAGE #027

4. RETURN TO THE MAIN MENU

VIDEO 000 TO 000. NEXT PAGE #002

5. QUIT

VIDEO 000 TO 000.

NEXT PAGE #092 CORRECT ANSWERS ARE 1,2,3,4,5,

PAGE #46 I PAGE

DEFINITION FOR STANDARD 2 ---

* * * ARM EXTENSION * * *

NEAR COMPLETE EXTENSION OF THE THROWING ARM TO THE REAR
DURING THE WIND-UP PHASE.

THE BALL IS MOVING BACKWARD WHICH IS CONSIDERED THE
WIND-UP PHASE OF THE THROW.

NO VTR SEGMENTS

THIS BRANCHES TO #47

PAGE #47 I PAGE

IF THE THROWER IS SIDE ORIENTED- IT IS LIKELY THAT
ARM EXTENSION WILL BE PRESENT. FOCUS ON THE ELBOW AS THE
BALL APPROACHES THE REAR DURING THE WIND-UP.

X

NO VTR SEGMENTS

THIS BRANCHES TO #45

PAGE #48 M PAGE

* * * WEIGHT TRANSFER * * *

1. YOU MAY CHOOSE TO SEE VIDEO

VIDEO 000 TO 000. NEXT PAGE #049

2. YOU MAY CHOOSE TO READ TEXT

VIDEO 000 TO 000. NEXT PAGE #067 CORRECT ANSWERS ARE
1,2

PAGE #49 M PAGE

<VIDEO> WHAT WOULD YOU LIKE NEXT?

1. A DEFINITION

VIDEO 000 TO 000. NEXT PAGE #050

2. A DEMONSTRATION

VIDEO 000 TO 000. NEXT PAGE #053

3. TO SEE AND ASSESS A TRIAL

VIDEO 000 TO 000. NEXT PAGE #054

4. CHANGE TO TEXT MODE

VIDEO 000 TO 000. NEXT PAGE #067

5. RETURN TO THE MAIN MENU

VIDEO 000 TO 000. NEXT PAGE #002

6. QUIT

VIDEO 000 TO 000. NEXT PAGE #092 CORRECT ANSWERS ARE
1,2,3,4,5,6

PAGE #50 M PAGE

<VIDEO> WHAT WOULD YOU LIKE TO SEE?

1. A STILL PICTURE

VIDEO 000 TO 000. NEXT PAGE #051

2. A CLOSE-UP

VIDEO 000 TO 000. NEXT PAGE #052

CORRECT ANSWERS ARE 1,2

PAGE #51 V PAGE

NEXT VTR SEGMENTS 20 TO 20

THIS BRANCHES TO #49

PAGE #52 V PAGE

NEXT VTR SEGMENTS 21 TO 21

THIS BRANCHES TO #49

PAGE #53 V PAGE

NEXT VTR SEGMENTS 22 TO 22

THIS BRANCHES TO #49

PAGE #54 I PAGE

YOU ARE ABOUT TO SEE THREE IDENTICAL SAMPLES OF THE
OVERHAND THROW. YOU WILL BE ASKED TO DETERMINE IF THE
STANDARD WAS PRESENT IN THE PERFORMANCE.

REMEMBER ---

LOOK ONLY FOR WEIGHT TRANSFER

NO VTR SEGMENT

THIS BRANCHES TO #55

RANDOM BRANCH PAGE #56

RANDOM BRANCH PAGE #57

RANDOM BRANCH PAGE #58

RANDOM BRANCH PAGE #59

PAGE #56 V PAGE

NEXT VTR SEGMENTS 23 TO 23

THIS BRANCHES TO #60

PAGE #57 V PAGE

NEXT VTR SEGMENTS 24 TO 24

THIS BRANCHES TO #61

PAGE #58 V PAGE

NEXT VTR SEGMENTS 25 TO 25

THIS BRANCHES TO #62

PAGE #59 V PAGE

NEXT VTR SEGMENTS 26 TO 26

THIS BRANCHES TO #63

PAGE #60 K PAGE

WAS WEIGHT TRANSFER PRESENT DURING THIS PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 49

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 64

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 64

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 64

CORRECT ANSWER IS #1

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #61 K PAGE

WAS WEIGHT TRANSFER PRESENT DURING THIS PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 49

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 64

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 64

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 64

CORRECT ANSWER IS #1

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #62 K PAGE

WAS WEIGHT TRANSFER PRESENT DURING THIS PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 64

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 49

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 64

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 64

CORRECT ANSWER IS #2

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #63 K PAGE

WAS WEIGHT TRANSFER PRESENT DURING THIS PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 64

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 49

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 64

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 64

CORRECT ANSWER IS #2

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #64 M PAGE

WHAT WOULD YOU LIKE NEXT?

1. MORE INFO ABOUT THE STANDARD

VIDEO 000 TO 000. NEXT PAGE #065

2. MORE INFO ABOUT HOW TO OBSERVE

VIDEO 000 TO 000. NEXT PAGE #066

CORRECT ANSWERS ARE 1,2

PAGE #65 I PAGE

WEIGHT TRANSFER MEANS THERE IS SMOOTH SHIFT OF THE BODY WEIGHT TO THE FRONT FOOT. IT MAY INCLUDE A STEP TO THE FOOT OPPOSITE THE THROWING ARM.

THE REAR FOOT MUST MOVE IN SOME WAY. IT MAY BE LIFTED AT THE HEEL OR DRUG IN THE DIRECTION OF THE TARGET. WATCH THE FOLLOWING EXAMPLES WHERE WEIGHT TRANSFER IS DEMONSTRATED.

NEXT VTR SEGMENTS 27 TO 27

THIS BRANCHES TO #22

PAGE #66 I PAGE

TO OBSERVE WEIGHT TRANSFER...

1ST- WATCH THE REAR FOOT AS THE BALL MOVES FORWARD. 2ND- IF THERE IS NO OPPOSITION- WEIGHT TRANSFER CAN NOT BE PRESENT.

3RD- ANY ACTION WHERE THE REAR FOOT IS LIFTED FROM ITS POSITION IS CONSIDERED WEIGHT TRANSFER.

NEXT VTR SEGMENTS 28 TO 28

THIS BRANCHES TO #22

PAGE #67 M PAGE

<TEXT> WHAT WOULD YOU LIKE NEXT?

1. A DEFINITION

VIDEO 000 TO 000. NEXT PAGE #068

2. A DEMONSTRATION

VIDEO 022 TO 022. NEXT PAGE #053

3. TO SEE AND ASSESS A TRIAL

VIDEO 000 TO 000. NEXT PAGE #049

4. RETURN TO THE MAIN MENU

VIDEO 000 TO 000. NEXT PAGE #002

5. QUIT

VIDEO 000 TO 000. NEXT PAGE #092

CORRECT ANSWERS ARE 1,2,3,4,5,

PAGE #68 I PAGE

DEFINITION FOR STANDARD 3 ---

* * * WEIGHT TRANSFER * * *

A SHIFT OF THE BODY WEIGHT TO THE FRONT FOOT AS THE THROW IS EXECUTED.

THE FRONT FOOT MUST BE OPPOSITE FROM THE THROWING ARM FOR WEIGHT TRANSFER TO BE PRESENT.

NO VTR SEGMENTS

THIS BRANCHES TO #69

PAGE #69 I PAGE

OPPOSITION MUST OCCUR PRIOR TO THE FORWARD MOTION OF THE BALL FOR WEIGHT TRANSFER TO BE PRESENT. WHEN THE REAR FOOT IS MOVED IN THE DIRECTION OF THE THROW CONSITUTES WEIGHT TRANSFER

WATCHING THE REAR FOOT IS THE KEY TO ANALYZING WEIGHT
TRANSFER ONCE OPPOSITION HAS BEEN ESTABLISHED.

NO VTR SEGMENTS

THIS BRANCHES TO #67

PAGE #70 M PAGE

* * * HIP/SHOULDER ROTATION * * *

1. YOU MAY CHOOSE TO SEE VIDEO

VIDEO 000 TO 000. NEXT PAGE #071

2. YOU MAY CHOOSE TO READ TEXT

VIDEO 000 TO 000. NEXT PAGE #089

CORRECT ANSWERS ARE 1,2

PAGE #71 M PAGE

<VIDEO> WHAT WOULD YOU LIKE NEXT?

1. A DEFINITION

VIDEO 000 TO 000. NEXT PAGE #072

2. A DEMONSTRATION

VIDEO 000 TO 000. NEXT PAGE #075

3. TO SEE AND ASSESS A TRIAL

VIDEO 000 TO 000. NEXT PAGE #076

4. CHANGE TO TEXT MODE

VIDEO 000 TO 000. NEXT PAGE #089

5. RETURN TO THE MAIN MENU

VIDEO 000 TO 000. NEXT PAGE #002

6. QUIT

VIDEO 000 TO 000. NEXT PAGE #092

CORRECT ANSWERS ARE 1,2,3,4,5,6

PAGE #72 M PAGE

<VIDEO> WHAT WOULD YOU LIKE TO SEE?

1. A STILL PICTURE

VIDEO 000 TO 000. NEXT PAGE #073

2. A CLOSE-UP

VIDEO 000 TO 000. NEXT PAGE #074

CORRECT ANSWERS ARE 1,2

PAGE #73 V PAGE

NEXT VTR SEGMENTS 29 TO 29

THIS BRANCHES TO #71

PAGE #74 V PAGE

NEXT VTR SEGMENTS 30 TO 30

THIS BRANCHES TO #71

PAGE #75 V PAGE

NEXT VTR SEGMENTS 31 TO 31

THIS BRANCHES TO #71

PAGE #76 I PAGE

YOU ARE ABOUT TO SEE THREE IDENTICAL SAMPLES OF THE
OVERHAND THROW. YOU WILL BE ASKED TO DETERMINE IF THE
STANDARD WAS PRESENT IN THE PERFORMANCE.

REMEMBER ---

LOOK ONLY FOR HIP/SHOULDER ROTATION

NO VTR SEGMENT

THIS BRANCHES TO #77

RANDOM BRANCH PAGE #78

RANDOM BRANCH PAGE #79

RANDOM BRANCH PAGE #80

RANDOM BRANCH PAGE #81

PAGE #78 V PAGE

NEXT VTR SEGMENTS 32 TO 32

THIS BRANCHES TO #82

PAGE #79 V PAGE

NEXT VTR SEGMENTS 33 TO 33

THIS BRANCHES TO #83

PAGE #80 V PAGE

NEXT VTR SEGMENTS 34 TO 34

THIS BRANCHES TO #84

PAGE #81 V PAGE

NEXT VTR SEGMENTS 35 TO 35

THIS BRANCHES TO #85

PAGE #82 K PAGE

WAS HIP/SHOULDER ROTATION PRESENT DURING THIS
PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 71

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 86

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 86

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 86

CORRECT ANSWER IS #1

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #83 K PAGE

WAS HIP/SHOULDER ROTATION PRESENT DURING THIS
PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 71

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 86

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 86

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 86

CORRECT ANSWER IS #1

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #84 K PAGE

WAS HIP/SHOULDER ROTATION PRESENT DURING THIS
PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 86

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 71

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 86

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 86

CORRECT ANSWER IS #2

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #85 K PAGE

WAS HIP/SHOULDER ROTATION PRESENT DURING THIS
PERFORMANCE?

YES

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 86

NO

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 71

NO KEYWORD

NO VTR SEGMENTS

THIS RESPONSE BRANCHES TO 86

X

NEXT VIDEO SCENE X TO X

'DEFAULT' PAGE...

THIS RESPONSE BRANCHES TO 86

CORRECT ANSWER IS #2

STANDARD COMPUTER REINFORCEMENT

SCORE THIS PAGE

PAGE #86 M PAGE

WHAT WOULD YOU LIKE NEXT?

1. MORE INFO ABOUT THE STANDARD

VIDEO 000 TO 000. NEXT PAGE #087

2. MORE INFO ABOUT HOW TO OBSERVE

VIDEO 000 TO 000. NEXT PAGE #088

CORRECT ANSWERS ARE 1,2

PAGE #87 I PAGE

SEQUENTIAL HIP/SHOULDER ROTATION MEANS THERE IS AN UNCOILING OF THE TRUNK INITIATED BY THE HIPS AND FOLLOWED BY THE SHOULDERS. IT OCCURS AS THE WEIGHT IS SHIFTED TO THE FRONT FOOT.

THE HIPS SHOULD ROTATE PAST THE TARGET. WHEN THERE IS NO OPPOSITION- HIP/SHOULDER ROTATION IS NOT PRESENT.

NEXT VTR SEGMENTS 36 TO 36

THIS BRANCHES TO #22

PAGE #88 I PAGE

TO OBSERVE HIP/SHOULDER ROTATION...

1ST- LOOK FOR WEIGHT TRANSFER TO THE FRONT FOOT. THE HIPS WILL BEGIN TO TURN IN THE DIRECTION OF THE THROW. 2ND- WATCH FOR THE THROWING ARM TO LAG BEHIND THE HIPS. 3RD- WATCH FOR COMPLETION OF THE THROWING MOTION- THE HIPS SHOULD BE TURNED PAST THE TARGET.

NEXT VTR SEGMENTS 37 TO 37

THIS BRANCHES TO #22

PAGE #89 M PAGE

<TEXT> WHAT WOULD YOU LIKE NEXT?

1. A DEFINITION

VIDEO 000 TO 000. NEXT PAGE #090

2. A DEMONSTRATION

VIDEO 031 TO 031. NEXT PAGE #075

3. TO SEE AND ASSESS A TRIAL

VIDEO 000 TO 000. NEXT PAGE #071

4. RETURN TO THE MAIN MENU

VIDEO 000 TO 000. NEXT PAGE #002

5. QUIT

VIDEO 000 TO 000. NEXT PAGE #092

CORRECT ANSWERS ARE 1,2,3,4,5,

PAGE #90 I PAGE

--- DEFINITION FOR STANDARD 4 ---

* * * H1P/SHOULDER ROTATION * * *

A SEQUENTIAL UNCOILING OF THE TRUNK WHICH IS INITIATED BY THE HIPS AND FOLLOWED BY THE SHOULDERS.

THE HIPS TURN PAST THE TARGET. WHEN SIDE ORIENTATION IS NOT PRESENT HIP/SHOULDER ROTATION CAN NOT OCCUR.

NO VTR SEGMENTS

THIS BRANCHES TO #91

PAGE #91 I PAGE

HIP/SHOULDER BEGINS AS THE WEIGHT IS TRANSFERED TO THE FRONT FOOT. THE FRONT FOOT MUST BE IN OPPOSITION TO THE THROWING ARM.

IF THE ROTATION OF THE HIP AND SHOULDER OCCUR AT THE SAME TIME--- LOOK FOR THE FOREARM TO LAG BEHIND THE SHOULDER. IF THIS OCCURS- ROTATION IS PRESENT.

NO VTR SEGMENTS

THIS BRANCHES TO #89

PAGE #92 I PAGE

THIS COMPLETES THE OVERHAND THROW LESSON.

NO VTR SEGMENT

THIS BRANCHES TO #0.

Appendix C: Approval/Request Forms

Mrs. Lois Atkins
Principal Fallon Park Elementary School
502 19th Street SE
Roanoke, VA 24016

April 14, 1986

Dear Mrs. Atkins,

I am writing to request that I be allowed to videotape children performing the overhand throw on Tuesday, April 15, 1986. The purpose of this videotaping is to visually document the various stages that occur in the motor development of the overhand throw. This videotape will be combined with a computer program in order to produce an interactive video training tape that will be used in conjunction with our teacher education program at Virginia Tech.

The efficiency with which children learn motor skills is of increasing concern to physical educators. Serious efforts are being made to ensure that maximum learning occurs in the allotted time. Despite our efforts there is evidence that suggests that children are not achieving at performance levels as judged by experts (Reuschlein and Vogel, 1982). The purpose of this study is to investigate the validity of an interactive video motor assessment training program designed to aid preservice teachers in the detection of the performance criteria of the overhand throw.

If, as indicated by the MEAP investigation (Reuschlein & Vogel, 1982), children are not demonstrating mature levels of performance, lowering the standards would only accommodate poor performance and contradict motor learning research findings. To make a difference in the motor development of children our efforts must work to ensure that motor performance reflect the qualitative aspects associated with mature performance. It seems relevant then to examine the ability of preservice teachers to identify and articulate performance criteria.

The ability to accurately perceive movement is the key to assessing learning in physical education. The teacher observes the various stages of learning and in doing so present information as well as past experience is revealed

An assessment provides further insight into the direction instruction must take actualizing a tool quite necessary in effective teaching.

The development of a system for error detection is important and should focus on discrepancies between the observed and the desired response. Experience is also important because it adds to the knowledge base of the teacher, this leads to the ability to detect errors more efficiently.

Through the use of interactive video technology we can design a variety of learning options to teach the skill of observation. Not only does interactive video technology provide us with a systematic approach for monitoring the strategies that are used by a variety of learners it also provides insight into abstract teacher behavior. If interactive video is a valid method of teaching preservice teachers to detect performance errors more efficiently we will have made significant gains in the ability to train them.

The logistics of this session will involve one camera operator and me for a period of about one hour. We would like to be outdoors for that period so we can avoid lighting the gymnasium. In the event of inclement weather we will need to be in the gymnasium space. If possible, we would like to request that Ms. Nicely be present in order to provide the safest environment for your students. The final product will consist of approximately 16 video segments of children performing the entire movement, 8 close up shots of various body parts during the performance which include the action of the trunk, arms, and feet, and 8 still frames that will be taken from the aforementioned 16 shots. Students will be given a verbal request to throw a ball as hard and as accurately as possible. Each child who has returned a permission form will be given at least 5 trials in which various shots will be made. In addition, children who demonstrate mature throwing patterns will be used as model samples and will most likely be requested to perform additional trials. We will provide the necessary equipment which will consist of a target 6 foot in diameter and softballs or rag balls which is dependent on the age group of children participating. We would prefer children in grade 3, 4, 5, or 6 be given the permission forms so we are sure to have more mature throwing patterns. Children who are used in the final product will not be identified in any

manner other than through the demonstration of various stages of throwing.

We will be more than happy to accomodate any requirements that you feel would contribute to the effectiveness of this project. We sincerely appreciate your cooperation and upon completion will share this project if there is sufficient interest.

Sincerely,

Kathy S. Eddleman
Department of Health, Physical Education, Recreation
and Dance
Virginia Tech
Blacksburg, VA 24061

Appendix D: Informed Consent

Dear Parents,

On Tuesday, April 15, 1986 I will be at Fallon Park Elementary School to videotape children performing the overhand throw. The purpose of this videotaping is to visually document the different stages children demonstrate in the motor development of the overhand throw. This videotape will be used in conjunction with our teacher education program at Virginia Tech Univeristy so that we might better train our preservice teachers to identify these stages. It is not our intent to evaluate the performance of the children participating but to describe the various stages we (as physical educators) know occur in the development of mature throwing patterns. Through the use of videotaping we feel that we can provide our preservice teachers with an opportunity to observe and identify these stages before actually conducting physical education instruction. Because we are committed to excellence in education we are requesting that your child be allowed to participate in this project as we strive to better educate our teachers. You can be assured that your child will not be identified in any manner. We appreciate your cooperation in this matter.

If you have any questions or would simply like more information about this project please contact me at the following address. Once again, thank you for your cooperation.

Sincerely,

Kathy S. Eddleman

For more information, contact:

Kathy S. Eddleman
 Division of Health, Physical Education, Recreation and Dance
 Virginia Tech
 Blacksburg, VA 24061 (703) 961-6561 Office
 982-8020 Home (local)

My child has permission to participate in the videotaping project that will be conducted on Monday, April 15, 1986 in conjunction with Virginia Tech University.

Name of child

Date

Signature of Parent/Guardian

Appendix E: Interactive Video Training Manual

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INTRODUCTION

It is recommended that sections of this manual be read Prior to beginning VTIVMAS. The sections entitled 'ALL SYSTEMS GO' and 'IT'S YOUR MOVE' are essential for understanding how the system operates.

You are strongly encouraged to use this package to create a lesson that best meets your needs. There is no time limit. Take as much or as little time you need to develop competence in qualitative movement analysis of the overhand throw.

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WELCOME TO THE VIRGINIA TECH
INTERACTIVE VIDEO MOTOR ASSESSMENT SYSTEM !
(V T I V M A S)

Interactive video is a relatively new educational technology which allows a computer to control a video cassette recorder (VCR).

What's exciting is that you don't need to be a computer expert to use the system. In fact, it's easy and you control it.

This type of technology allows you to decide the progression through each lesson; that is, what you will see or read and when.

The Virginia Tech Interactive Video Motor Assessment System (VTIVMAS) is a self-contained learning package.

The purpose of VTIVMAS is to provide training in qualitative movement analysis. Qualitative movement analysis refers to standards of performance which are related to biomechanically correct technique.

This lesson will teach you four standards associated with the mature performance of the overhand throw.

GETTING STARTED

To begin the VTIVMAS you will need the three items listed below. If you have any questions ask your supervisor.

1. 1/2" Video cassette
"VTIVMAS"
"Overhand Throw"
"Kathy S. Eddleman"
2. Computer Disk
"VTIVMAS: Overhand Throw"
3. Interactive video motor assessment manual "Virginia Tech Interactive Video Motor Assessment System"

ONCE YOU HAVE THESE ITEMS YOU MAY PROCEED.

GENERAL INFORMATION

You do not need to be an expert to use this system! However, there are a few general rules that you should keep in mind while using this program.

1. Once the VCR is turned on you will not need to adjust the controls until the end of the program when you will turn it off.

BE PATIENT! The VCR takes a little time to find each scene.

2. When the red light on the disk drive is on, information is being placed in the memory of the computer. Do not type on the keyboard while this light is on.

3. A flashing cursor will often appear in the lower right hand portion of your screen. A flashing "D" means that information is being loaded from the disk. A flashing "M" means more memory is being made available and a flashing "L" means information is being loaded into the memory.

Again, BE PATIENT. There is no need to use any keys once you have entered your initial choice.

4. You may adjust the volume and the contrast for the monitor to suit your taste. USE THE CONTROLS ON THE MONITOR.

5. When your are ready to quit, please select a QUIT option from the computer. DO NOT JUST TURN THE POWER OFF or you will lose the record of your lesson.

IF AT ANY POINT YOU ARE UNSURE OF WHAT TO DO NEXT.... CALL YOUR SUPERVISOR.

STEP BY STEP INSTRUCTIONS

Now you are ready to begin the "Overhand Throw" lesson.

This portion of the manual is broken down into three parts: ALL SYSTEMS GO, SYSTEM INITIALIZATION AND IT'S YOUR MOVE. The three parts describe the steps necessary complete the VTIVMAS program.

ALL SYSTEMS GO describes the steps necessary to turn on all power sources.

SYSTEM INITIALIZATION describes the computer operations that will occur while the systems are being initialize.

Illustrations of the screens that will appear on your monitor will be presented to ensure proper initialize of your program.

IT'S YOUR MOVE describes the choices that you may make during the VTIVMAS program.

LET'S GET STARTED!

ALL SYSTEMS GO

1. Turn on the power to the VCR. The power switch is located on the front lower left hand corner. Push it in for ON. Lights on the front of the VCR will appear when the machine is on.
2. Remove the cover from the cassette. Insert the cassette into the VCR. BE SURE THE LABEL ON THE CASSETTE CAN BE READ. Push the cassette into the slot and the VCR will drop the cassette into place. The STOP control will be lit.
3. Monitors may vary. Find the proper ON/OFF switch on the monitor and turn it on. Remember that audio will be played with selected video scenes and the volume control may need to be adjusted.
4. Insert the computer disk into DRIVE 1 following the direction of the arrow on the front of the disk. The label should be in an up position and the notch should be on the left hand side of the disk. Push down to close the door.

5. Turn on the power to the computer. The switch is located on the back lower left corner of the keyboard. Push up for on.

SYSTEM INITIALIZATION

This section will describe and illustrate the pages that will appear on your screen during the initialization process.

SIMPLY FOLLOW THE DIRECTIONS ON THE COMPUTER SCREEN.

This section is intended to be used as a reference. There is no need to follow it step by step unless you encounter problems.

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VIRGINIA TECH PRESENTS...

* * *INTERACTIVE VIDEO * * *

840101

'THE INSTRUCTOR'

MASTER DISK 4.2

SERIAL # 2356 M31

(C)1983 BCD. ALL RIGHTS RESERVED

PRESS SPACE BAR TO PROCEED

If this screen does not appear, remove the video cassette from the VCR and begin the ALL SYSTEMS GO procedures again.

THANK YOU ! ! !

... FOR USING THE BCD INTERACTIVE SYSTEM.

PLEASE TYPE THE FOLLOWING INFORMATION:

PLEASE PRESS THE <RETURN> KEY AFTER EACH ENTRY.

WHAT'S YOUR NAME

(FIRST & LAST) >

AND PLEASE YOUR STUDENT ID#

If you make a mistake while typing in any information, use the arrow keys to move the cursor. Simply type over the old information.

Your student ID# was assigned to you at the beginning of the training. Please be sure to type in the appropriate #. If you are unsure, please ask your supervisor.

HI, _____

YOUR ID# IS _____

CORRECT? (PRESS Y OR N>

EXAMPLE: 1/15/85

DATE>

TODAY'S DATE IS _____

IT IS TUESDAY

CORRECT (PRESS Y OR N>

Type in the information accurately. You may use the arrow keys to move the cursor OR you may use the Y or N option. Selecting the Y will continue the program through the initialization. Selecting the N will let you retype the information.

OKAY, __

HERE ARE THE AVAILABLE LESSONS:

1.OVERHAND THROW

PLEASE TYPE THE NUMBER OF YOUR CHOICE.

(PRESS 'ESC' IF YOU WANT TO QUIT NOW.)

THE LESSON YOU WANT IS CALLED 'OVERHAND THROW'

CORRECT? (PRESS Y OR N)

There should only be one lesson for you to choose. If any other lesson titles appear, please consult your supervisor. DO NOT SELECT THE QUIT OPTION. This will cause the initialization process to be terminated.

HERE WE GO....

I'M GETTING THE "OVERHAND THROW'

LESSON READY FOR YOU...

IT WILL TAKE A FEW MOMENTS....

PLEASE STAND BY...

NOW LOADING VIDEO DATAFILE

SYSTEM INITIALIZATION IN PROCESS

This screen will indicate the 37 video scenes that are being loaded into the computer memory.

THE VCR WILL BE ACTIVATED AND WILL PLAY FOR A FEW FRAMES.

This is done automatically. There is no need for you to alter the controls on the VCR. The video cassette number is being read during this process. The screen should show the tape number as "1".

THANKS, _____

YOU MAY INTERRUPT A
VIDEO SCENE BY PRESSING THE SPACE BAR.
YOU MAY RESUME IF YOU WISH.

NOTE A FLASHING 'D' MEANS

THE SYSTEM IS LOADING FROM THE DISK.-

A FLASHING 'M' MEANS

THE SYSTEM IS MAKING MORE MEMORY ROOM

A FLASHING 'L' MEANS INFORMATION IS
BEING LOADED INTO THE MEMORY.

OKAY, _____ , NOW JUST PRESS THE SPACE BAR AND WE'LL
BEGIN.

This is the last screen of the initialization process. Once you press the space bar a video scene will appear as an introduction to the overhand throw lesson.

REMEMBER YOU CAN INTERRUPT A VIDEO SCENE BY PRESSING THE SPACE BAR. A menu will appear which will help you make a selection from the point you exited the scene.

NOW, you decide what will happen next.....

ITS YOUR MOVE

The 'Overhand Throw' lesson is broken down into 4 MODULES. There is one for each qualitative standard you will be learning.

Each MODULE is identical in design. The only difference is in the information and video scenes presented. You choose the MODULE from the MAIN MENU.

Each MODULE let's you choose the MODE. It also gives you lots of choices of information from the OPTIONS MENU.

LET'S CONTINUE TO FIND OUT MORE ABOUT THE 'OVERHAND THROW' LESSON.

The following MAIN MENU will appear on your screen.
These are the 4 modules (one for each standard).

<< MAIN MENU>> WHERE WOULD YOU BEGIN?

1. STANDARD 1 - SIDE ORIENTATION
2. STANDARD 2 - ARM EXTENSION
3. STANDARD 3 - WEIGHT TRANSFER
4. STANDARD 4 - HIP/SHOULDER ROTATION
5. QUIT

PRESS THE NUMBER OF YOUR CHOICE.....

Each module contains 2 MODES. They are:

1. A VIDEO MODE which allows you to see a video scene with each option you choose.
2. A TEXT MODE which allows you to read information from the screen without viewing the video. The information in the text mode is different from the video mode.

Here's an example of the screen you will see to select the mode.

* * * SIDE ORIENTATION * * *

1. You may choose to see video
2. You may choose to read text

You may alternate between modes as often as you like.

Note: the <VIDEO> or <TEXT> label will appear at the top of your screen to help you keep track of the mode you have selected.

The OPTIONS MENU will appear on the screen when you select the mode. This option will allow you to decide what information you will receive and how you receive it. It also let's you practice qualitative analysis of overhand throw trials. YOU CAN NOT PRACTICE QUALITATIVE ANALYSIS FROM THE TEXT MODE.

Here's an example of the OPTIONS MENU:

<VIDEO> WHAT WOULD YOU LIKE NEXT?

1. A DEFINITION
2. A DEMONSTRATION
3. TO SEE AND ASSESS A TRIAL
4. CHANGE TO THE TEXT MODE
5. RETURN TO THE MAIN MENU
6. QUIT

PRESS THE NUMBER OF YOUR CHOICE...

The following is a summary of the options available from the OPTIONS MENU for the video mode. The text mode does not permit the option TO SEE AND ASSESS A TRIAL.

1. A DEFINITION

This option let's you choose between a STILL PICTURE and CLOSE-UP.

A STILL PICTURE shows the full body position when the standard is being properly executed. A verbal definition is given.

A CLOSE-UP shows the parts of the body that should be observed when analyzing the throw. A computer graphic label identifies the standard.

2. A DEMONSTRATION lets you see a model sample of all standards being demonstrated correctly.

3. TO SEE AND ASSESS A TRIAL

This option gives you a chance to practice qualitative movement analysis. Four different video scenes have been identified. These scenes are randomly selected by the computer to test your skill.

Three identical samples of the overhand throw will be shown followed by a question. The computer will let you know if you're RIGHT or WRONG.

RIGHT answers take you back to the potions menu for more practice or other selections.

WRONG answers take you to more choices...

You may choose MORE INFO. ABOUT THE STANDARD or, MORE INFORMATION ABOUT HOW TO OBSERVE. Each option combines computer information with video scenes illustrating correct and incorrect performances.

4. CHANGE TO THE TEXT MODE

This option lets's you change the mode of information you will receive.

CHANGING BETWEEN MODES ACROSS MODULES IS NOT POSSIBLE.

5. RETURN TO THE MAIN MENU

This option let's you choose the standard you wish to learn. Changing standards can only occur from the main menu.

6. QUIT

This option let's you exit the program. The computer will automatically map and score your performance. You may receive the record of your performance at the conclusion of this project.

It is important that you return the system to the state you found it in by unloading the disk, video tape and turning everything off.

Appendix F: Written Materials

STANDARD 1

SIDE ORIENTATION

SIDE ORIENTATION PARALLEL TO THE INTENDED DIRECTION OF THE THROW

--Side orientation means that the feet will be parallel to the target during the wind-up. The head should be turned so the thrower is looking over the shoulder.

--The key to analyzing side orientation lies in a clear definition of the word parallel. As the ball moves backward (wind-up), the rear foot should be parallel to the direction of the throw.

--When the front foot is pointing in another direction, side orientation can be present. Watch to see if the thrower is looking over the shoulder facing the target. The front foot must be opposite the throwing hand.

To observe side orientation:

1. Watch the feet. Are they parallel to the target? Is the front foot opposite the throwing hand?
2. Watch the head and shoulders. Is the thrower looking over the shoulder facing the target?
3. Watch the ball as it moves backward. This is when you should make your decision.

STANDARD 2

ARM EXTENSION

NEAR COMPLETE EXTENSION OF THE THROWING ARM TO THE REAR
DURING THE WIND-UP.

--Arm extension means that the throwing arm will be almost straight during the wind-up phase.

--If the thrower is side oriented then arm extension can occur. Focus on the elbow as the ball approaches the rear during the wind-up.

--Arm extension must be identified before the ball starts forward.

To observe arm extension:

1. Watch the throwing arm as it moves backward during the wind-up. Is the ball moving backward?
2. Focus on the elbow. Is it nearly straight before the ball begins to move forward?
3. The arm should never be completely straight. The angle at the elbow is nearly straight when the elbow joint approaches 150 degrees.

STANDARD 3

WEIGHT TRANSFER

WEIGHT TRANSFER TO THE FOOT OPPOSITE THE THROWING ARM AS THE
THROWING HAND PASSES ABOVE THE SHOULDER.

--Weight transfer means there is a smooth shift of the body weight to the front foot. This must occur as the throw is being executed. It may include a step to the foot opposite the throwing arm.

--The rear foot must move in some way. It may be lifted at the heel or drag in the direction of the target.

--Opposition must occur prior to the forward motion of the ball for weight transfer to be present. The rear foot moved in the direction of the thrown constitutes weight transfer.

To observe weight transfer:

1. Watch the front foot. Is there opposition? When there is no opposition weight transfer can not be present.
2. Watch the rear foot as the ball moves forward. Does it move in the direction of the target?
3. Watch the ball. Is it moving forward? Any action where the rear foot is lifted from its position is considered weight transfer if the ball is moving forward.

STANDARD 4

STANDARD MARKED SEQUENTIAL HIP AND SHOULDER ROTATION

--Sequential hip/shoulder rotation means there is an uncoiling of the trunk initiated by the hips and followed by the shoulders. It occurs as the weight is shifted to the front foot.

--The hips should rotate past the target. When there is no opposition hip/shoulder rotation can not be present.

--If the rotation of the hip and shoulder occur at the same time, look for the forearm to lag behind the hips. If this occurs, rotation is present.

To observe hip/shoulder rotation:

1. Watch the front foot. Is the weight shifting to the front foot? The hips will begin to turn in the direction of the throw.
2. Watch for the throwing arm to lag behind the hips. Are the hips and shoulders moving at the same time?
3. Watch for the completion of the throwing motion. Are the hips turned past the direction of the target?

Appendix G: Testing Manual

TESTING PROTOCOL

The testing procedures outlined in this manual should be followed during the test administration on days 1 and 3 of the project.

The test administrator should make note of any events which occur that are not outlined in the procedures.

EQUIPMENT CHECKLIST

The following equipment will be necessary to complete the VTIVMAS testing.

Check the following items:

- _____ Testing manual
- _____ 1/2" video cassette player
- _____ Color monitor (audio turned off)
- _____ Remote control
- _____ Striking sample video tape
- _____ Pre-test video tape
- _____ Student test booklets (1 each)
- _____ Student answer sheets (4 each)
- _____ 4 large manila envelopes
- _____ Sharpened pencils (1 box)
- _____ Testing site
- _____ Testing sign

SET-UP

Complete the following prior to the scheduled testing time on day 1 or 3.

Check the following items:

- _____ Properly connect the VCR and monitor.
- _____ Place tape #1 in the VCR and rewind to the beginning.
- _____ Turn the volume on the monitor off.
- _____ Position VCR set up so that all subjects can see the monitor.
- _____ Place a sharpened pencil and a test booklet (face down) on the desk top for each subject.
- _____ Insert an answer sheet between the title page and page 1 (answer sheet # 1-14).
- _____ position the test administrator with the remote control close to the VCR set up.
- _____ Have appropriate tapes ready.
- _____ Place the testing# sign on the door.

STEP 1

Have the subjects seated at a desk with a test booklet.
Instruct the subjects not to open the test booklet until
they are told to do so.

Read this to the subjects:

"PLEASE BE SEATED AT A DESK WHERE THERE IS A TEST BOOKLET.
DO NOT OPEN #OUR BOOKLET UNTIL #OUR ARE INSTRUCTED TO DO
SO."

Turn the page.

STEP 2

After all subjects have been seated read the following information to them.

"MY NAME IS _____ AND I WILL BE CONDUCTING ALL ASPECTS OF THIS PROJECT. SINCE THIS IS RESEARCH, THERE ARE CERTAIN PROCEDURES THAT MUST BE FOLLOWED. LET ME EXPLAIN THESE TO YOU."

1. "YOU ARE EXPECTED TO ATTEND 3 SESSIONS AS FULFILLMENT OF YOUR AGREEMENT TO PARTICIPATE. SOME OF YOU WILL EXPERIENCE TRAINING DURING THE REGULARLY SCHEDULED CLASS TIME. OTHERS WILL BE ALLOWED TO MISS A PARTICULAR CLASS PERIOD BUT ARE EXPECTED TO COMPLETE THE TRAINING OUTSIDE OF CLASS TIME. AT THIS POINT, WE DO NOT KNOW WHO WILL MAKE UP THESE GROUPS."
2. "YOU ARE EXPECTED TO CONCENTRATE AND DO YOUR BEST THROUGHOUT THIS PROJECT."
3. "YOU MAY NOT DISCUSS THE EVENTS OF THIS PROJECT WITH ANYONE UNTIL ITS COMPLETION."

Turn the page.

STEP 3

Read the following information to the subjects.

"YOU WILL FIND A TEST BOOKLET ON THE DESK IN FRONT OF YOU.
DO NOT OPEN IT UNTIL YOUR ARE INSTRUCTED TO DO SO."

"CHECK TO SEE IF YOUR BOOKLET CONTAINS AN ANSWER SHEET."

"WRITE YOUR NAME ON THE ANSWER SHEET NOW."

Turn the page.

STEP 4

Read the following to the subjects:

"OPEN YOUR BOOKLETS TO PAGE 1."

"THANK-YOU FOR PARTICIPATING IN THIS PROJECT."

"YOU MAY OBTAIN THE RESULTS OF THIS TEST AT THE CONCLUSION OF THE PROJECT BY COMPLETING THE INFORMATION BELOW. IF YOU WOULD LIKE THE RESULTS, COMPLETE THIS INFORMATION NOW."

"WAIT. DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO."

Turn the page.

STEP 5

Read the following to the subjects:

"TURN TO PAGE 2 OF YOUR BOOKLET. PLEASE PRINT THE REQUESTED INFORMATION."

Name

"PRINT YOUR FIRST AND LAST NAME."

Sex

MARK FEMALE OR MALE."

Date

"PRINT THE LETTERS 'PRE' OR 'POST' AND TODAY'S DATE."

"INDICATE YOUR CURRENT CLASS STATUS BY CHECKING ONE OF THE FOLLOWING: FRESHMAN; SOPHOMORE; JUNIOR; SENIOR; GRADUATE;

Major

"PLEASE CHECK IF YOU ARE A PHYSICAL EDUCATION MAJOR. IF YOU ARE NOT, CHECK 'OTHER' AND PRINT YOUR MAJOR ON THE SAME LINE."

"WAIT. DO NOT TURN THE PAGE UNTIL YOU ARE INSTRUCTED TO DO SO."

Turn the page.

STEP 6

When all subjects have completed the demographic information, read the following information.

"TURN TO PAGE 3 OF YOUR BOOKLET AND READ ALONG AS I READ ALOUD."

"THE FOLLOWING TEST IS BEING ADMINISTERED TO SEE IF YOU CAN IDENTIFY 4 QUALITATIVE STANDARDS ASSOCIATED WITH THE MATURE PERFORMANCE OF THE OVERHAND THROW." "A QUALITATIVE STANDARD REFERS TO ELEMENTS RELATED TO BIOMECHANICALLY CORRECT TECHNIQUE." "FIRST, YOU WILL BE TOLD WHICH STANDARD YOU WILL IDENTIFY. THIS WILL BE IN THE FORM OF A QUESTION. FOR EXAMPLE: 'IS _____ PRESENT IN THIS PERFORMANCE?'" "THE QUESTION WILL BE FOLLOWED BY A VIDEO SAMPLE OF THE OVERHAND THROW."

"EACH SAMPLE WILL BE SHOWN CONSECUTIVELY 3 TIMES AND WILL LAST APPROXIMATELY 8 TO 12 SECONDS. IT IS RECOMMENDED THAT YOU DIRECT YOUR ATTENTION TO THE MONITOR PRIOR TO EACH SAMPLE. YOU WILL BE REMINDED OF THIS THROUGHOUT THE TEST."

"NEXT, YOU WILL MARK YOUR ANSWER SHEET BY BLACKENING THE CORRESPONDING CIRCLE UNDER THE HEADINGS: YES OR NO."

"YES MEANS THE STANDARD IS PRESENT." "NO MEANS THE STANDARD IS NOT PRESENT." "WAIT. DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO.

Turn the page.

STEP 7

Answer any questions that may be asked. Do not identify the standards in any manner. When all questions have been answered, read the following information.

"TURN TO PAGE 4 OF YOUR BOOKLET."

"TRY THIS PRACTICE QUESTION. YOU WILL BE SHOWN A SAMPLE OF THE SKILL STRIKING."

"THE STANDARD YOU ARE TO IDENTIFY IS RACQUET CONTACT WITH THE BALL WHILE THE HAND IS BELOW THE ELBOW."

"THE ACTUAL TEST WILL SHOW YOU 3 IDENTICAL SAMPLES."

"WATCH THE MONITOR."

Read the question: "IS RACQUET CONTACT PRESENT IN THIS PERFORMANCE?"

Play the striking video sample now. Stop tape at the end of the sample. Read the following:

"
MARK YOUR ANSWER."

"WAIT. DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO.

Turn the page.

STEP 8

Insert tape #2 into the VCR. Rewind the tape to the beginning.

Read the following to the subjects:

"TURN TO PAGE 5 OF #OUR BOOKLET. PLEASE ASK AND QUESTIONS NOW."

"WAIT. DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO."

Answer any questions. Do not identify the standards in any manner.

Turn the page.

STEP 9

When all questions have been answered, read the following:

"TURN TO PAGE 6 OF YOUR BOOKLET."

"CHECK TO MAKE SURE YOUR NAME IS ON THE ANSWER SHEET."

"WAIT. DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO."

Turn the page.

STEP 10

Check to make sure all names are on the answer sheets. Read the following to the subjects:

"TURN TO PAGE 7 OF #OUR TEST BOOKLET. READ ALONG AS I READ ALOUD."

"I WILL REMIND YOU NOT TO TALK DURING THIS TEST AND PLEASE USE YOUR TEST BOOKLET TO COVER YOUR ANSWER SHEET DURING THE TEST. ONCE THE TEST HAS BEGUN, YOU MAY NOT ASK AND QUESTIONS."

"NOW YOU WILL BE SHOWN THE STANDARDS YOU ARE TO IDENTIFY. THIS WILL APPEAR ON YOUR SCREEN FOR APPROXIMATELY 25 SECONDS. DO NOT RECORD THESE STANDARDS IN ANY MANNER."

YOU MAY CLOSE YOUR BOOKLET AND DIRECT YOUR ATTENTION TO THE MONITOR."

"THE TESTING WILL NOW BEGIN."

Turn the page.

STEP 11

Read the following to the subjects:

"YOU ARE ABOUT TO SEE THE 4 STANDARDS YOU WILL BE ASKED TO IDENTIFY. TRY TO REMEMBER THEM AS BEST YOU CAN. YOU WILL ONLY BE SHOWN THESE 1 TIME DURING THE TEST."

WATCH THE MONITOR."

Play the video scene identifying the standards. Put the VCR in 'pause' when the screen goes to black.

Turn the page.

STEP 12

Read the following to the subjects:

"WE WILL BEGIN WITH QUESTION # 1."

"WATCH THE SAMPLE CAREFULLY AND DECIDE IF THE STANDARD WAS PRESENT IN THE PERFORMANCE. REMEMBER, THE 3 TRIALS ARE IDENTICAL."

Turn the page.

STEP 13

Play the video samples #'s 1-14. Put the VCR in 'Pause' after each sample goes to black.

Begin testing by saying: "WATCH THE MONITOR."

Turn the page.

PRE-TEST ORDER (BLOCK 1)

1. Is SIDE ORIENTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...

2. Is WEIGHT TRANSFER present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...

3. Is SIDE ORIENTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...

4. Is HIP/SHOULDER ROTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...

5. Is SIDE ORIENTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...

6. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

7. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

8. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

9. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

10. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

11. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

12. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

13. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

14. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

STEP 14

After video sample #14 has been completed, rewind the video tape to the first video sample.

Read the following to the subjects:

"CHECK YOUR ANSWER SHEET TO MAKE SURE ALL 14 QUESTIONS HAVE BEEN ANSWERED."

"PUT YOUR ANSWER SHEET IN THE ENVELOPE WHEN IT COMES TO YOU."

"TAKE A SECOND ANSWER SHEET WITH QUESTION #'S 15-28." "PRINT YOUR NAME AND DATE ON THE ANSWER SHEET."

Check all answer sheets for names.

STEP 15

Play the video samples #'s 15-28. Put the VCR in 'pause' after each sample goes to black.

Begin testing by saying: "THE NEXT 14 QUESTIONS YOU WILL ANSWER FOLLOW THE SAME FORMAT AS THE SET YOU JUST COMPLETED.

WATCH THE MONITOR."

Turn the page.

PRE-TEST ORDER (BLOCK 1)

15. Is HIP/SHOULDER ROTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
16. Is ARM EXTENSION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
17. Is ARM EXTENSION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
18. Is WEIGHT TRANSFER present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
19. Is HIP/SHOULDER ROTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...

20. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

21. Is Side ORIENTATION present in this performance?

Watch the monitor...

Play the scene....

Mark your answer...

22. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

23. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor...

Play the scene....

Mark your answer...

24. Is ARM Extension present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

25. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

26. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

27. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

28. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

STEP 16

After video sample #28 has been completed, rewind the video tape to the first video sample.

Read the following to the subjects:

"CHECK YOUR ANSWER SHEET TO MAKE SURE ALL 14 QUESTIONS HAVE BEEN ANSWERED."

"PUT YOUR ANSWER SHEET IN THE ENVELOPE WHEN IT COMES TO YOU."

"TAKE ANOTHER ANSWER SHEET WITH QUESTION #'S 29-42." "PRINT YOUR NAME AND DATE ON THE ANSWER SHEET." Check all answer sheets for names.

Turn the page.

STEP 17

Play the video samples #'s 29-42. Put the VCR in 'pause' after each sample goes to black.

Begin testing by saying: "WATCH THE MONITOR."

Turn the page.

PRE-TEST ORDER (BLOCK 1)

29. Is ARM EXTENSION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
30. Is HIP/SHOULDER ROTATION present in this Performance?
Watch the monitor....
Play the scene....
Mark your answer...
31. Is HIP/SHOULDER ROTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
32. Is ARM EXTENSION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
33. Is WEIGHT TRANSFER present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...

34. Is SIDE ORIENTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
35. Is HIP/SHOULDER ROTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
36. Is SIDE ORIENTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
37. Is WEIGHT TRANSFER present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
38. Is SIDE ORIENTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...

39. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

40. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

41. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

42. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

STEP 18

After video sample #42 has been completed, rewind the video tape to the first video sample.

Read the following to the subjects:

"CHECK YOUR ANSWER SHEET TO MAKE SURE ALL 14 QUESTIONS HAVE BEEN ANSWERED."

"PUT YOUR ANSWER SHEET IN THE ENVELOPE WHEN IT COMES TO YOU."

"TAKE A SECOND ANSWER SHEET WITH QUESTION #'S 43-56." "PRINT YOUR NAME AND DATE ON THE ANSWER SHEET." Check all answer sheets for names.

Turn the page.

PRE-TEST ORDER (BLOCK 1)

43. Is WEIGHT TRANSFER Present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
44. Is SIDE ORIENTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
45. Is WEIGHT TRANSFER present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
46. Is SIDE ORIENTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
47. Is ARM EXTENSION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
48. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

49. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

50. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

51. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

52. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

53. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

54. Is ARM EXTENSION present in this Performance?

Watch the monitor....

Play the scene....

Mark your answer...

55. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

56. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

STEP 19

After video sample #56 has been completed, stop the video tape. Pass out the questionnaire.

Read the following to the subjects:

"THIS COMPLETES THE TESTING. TAKE A FEW MOMENTS TO FILL OUT THIS QUESTIONNAIRE THEN YOU MAY TAKE A _____ MINUTE BREAK WHILE THE TESTS ARE BEING SCORED."

"PLEASE Return TO THIS ROOM AT _____ AM / PM."

Turn the page.

VTIVMAS Questionnaire

Name _____ Date _____

Please answer the following questions:

1. How would you rate this task?

_____ Very difficult

_____ Difficult

_____ Average

_____ Easy

_____ Very easy

2. Have you had any experiences that helped you to perform this task? If YES, briefly describe each.

_____ Yes (example: I have coached baseball.)

_____ NO

3. Have you taken any courses that helped you to perform this task? If YES, please list the name of each course.

_____Yes (example: Softball, Kinesiology, etc.)

_____NO

4. Please list anything you believe hindered your performance of this task?

The following questions relate to each standard you were asked to identify. you may indicate more than one answer by placing an "X" in the appropriate space.

5. When you were asked to identify SIDE ORIENTATION, what part(s) of the body did you watch?

Head Shoulders Arms
 Trunk Hips Legs
 Feet

6. When you were asked to identify WEIGHT TRANSFER, what part(s) of the body did you watch?

Head Shoulders Arms
 Trunk Hips Legs
 Feet

7. When you were asked to identify HIP/SHOULDER ROTATION, what part(s) of the body did you watch?

Head Shoulders Arms
 Trunk Hips Legs
 Feet

8. When you were asked to identify ARM EXTENSION, what part(s) of the body did you watch?

_____ Head _____ Shoulders _____ Arms

_____ Trunk _____ Hips _____ Legs

_____ Feet

9. How do you rate your ability to identify the 4 qualitative standards associated with the mature performance of the overhand throw?

_____ Excellent _____ Good _____ Average _____ Fair

_____ Poor

10. Use this space to tell me anything you think I should know.

STEP 20

Use the following answer keys to score each test. It is recommended that you score each set separately.

For example: Use key #1 to score each test with questions 1-14. Record each score on the master score sheet(s). Repeat this procedure for each set of questions (15-28; 29-42; 42-56).

Mark those questions that are incorrect. Record the total number of correct items on the master score sheet(s).

Turn the page.

ANSWER SHEET KEYS

PRE-TEST

KEY 1	2	3	4
1. NO	15. NO	29. YES	43. YES
2. YES	16. NO	30. YES	44. Yes
3. NO	17. NO	31. NO	45. NO
4. NO	18. YES	32. NO	46. YES
5. YES	19. NO	33. YES	47. NO
6. YES	20. YES	34. NO	48. YES
7. YES	21. YES	35. NO	49. YES
8. YES	22. YES	36. YES	50. YES
9. YES	23. YES	37. YES	51. NO
10. YES	24. NO	38. YES	52. YES
11. NO	25. NO	39. NO	53. NO
12. NO	26. NO	40. NO	54. NO
13. YES	27. YES	41. NO	55. NO
14. YES	28. NO	42. NO	56. YES

POSTTEST

KEY 1	2	3	4
1. YES	15. NO	29. YES	43. NO
2. YES	16. YES	30. YES	44. YES
3. NO	17. NO	31. NO	45. NO
4. YES	18. NO	32. NO	46. YES
5. YES	19. YES	33. NO	47. NO
6. YES	20. YES	34. YES	48. NO
7. YES	21. YES	35. YES	49. NO
8. YES	22. YES	36. YES	50. YES
9. YES	23. NO	37. YES	51. YES
10. YES	24. NO	38. YES	52. YES
11. NO	25. NO	39. NO	53. NO
12. NO	26. NO	40. NO	54. NO
13. YES	27. NO	41. YES	55. NO
14. NO	28. YES	42. YES	56. NO

Master Score Sheet

Pre-posttest

<u>Name</u>	<u>Set 1</u>	<u>Set 2</u>	<u>Set 3</u>	<u>Set 4</u>	<u>Total</u>
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____
7.	_____	_____	_____	_____	_____
8.	_____	_____	_____	_____	_____
9.	_____	_____	_____	_____	_____
10.	_____	_____	_____	_____	_____
11.	_____	_____	_____	_____	_____
12.	_____	_____	_____	_____	_____
13.	_____	_____	_____	_____	_____
14.	_____	_____	_____	_____	_____
15.	_____	_____	_____	_____	_____

STEP 21

Rank order the scores from highest to lowest. Place them in the appropriate spaces on the Rank Order Sheet.

Circle those lines which illustrate a perfect match among all 3 scores.

If matching does not produce more than 5 subjects per group, randomly assign the rank ordered scores to groups.

The Rank Order Sheet lists the randomized group assignments under each score entry.

Letter "A" means subjects are assigned to the INTERACTIVE TRAINING GROUP.

Letter "B" means subjects are assigned to the TEACHER TRAINING GROUP.

Letter "C" means subjects are assigned to the CONTROL GROUP.

Turn the page.

STEP 22

Make a list of the subjects which are assigned to each group.

Use this list to:

1. identify the order of subjects will be called in to the testing room following the break.
2. call roll at the beginning of each training session.
3. call roll at the beginning of the posttest session.

Indicate any subjects that fail to complete the project. If known, briefly state the reasons.

Turn the page.

STEP 23

Call each group in separately from the break. Begin with the VIDEOTAPED TRAINING GROUP.

Read the following to the subjects:

"YOU HAVE BEEN SELECTED AS A GROUP WHICH WILL PARTICIPATE IN QUALITATIVE MOVEMENT ANALYSIS TRAINING."

"WE NEED TO SELECT A TIME TOMORROW WHERE ALL OF YOU CAN BE PRESENT. A TWO HOUR BLOCK OF TIME IS NECESSARY."

Write the time here:

Indicate the testing site

here:_____

"YOU ARE EXPECTED TO BE HERE TOMORROW AT _____ ' O'CLOCK. PLEASE REMEMBER NOT TO DISCUSS THIS PROJECT WITH OTHERS."

"I WILL ALSO REMIND YOU TO RETURN TO THIS ROOM ON _____ AT _____ O'CLOCK."

Turn the page.

STEP 23

Call in subjects assigned to the INTERACTIVE TRAINING GROUP.
Read the following information to the subjects.

"YOU HAVE BEEN SELECTED AS A GROUP WHICH WILL PARTICIPATE IN
QUALITATIVE MOVEMENT ANALYSIS TRAINING."

"SELECT A TIME IN WHICH YOU CAN RETURN FOR THIS TRAINING. A
TWO HOUR BLOCK OF TIME WILL BE NECESSARY."

"WRITE YOUR NAME NEXT TO THE TIME YOU HAVE CHOSEN FOR YOUR
TRAINING."

Use the group "A" schedule to record these times.

"PLEASE REMEMBER NOT TO DISCUSS THEIR PROJECT WITH OTHERS."

STEP 23

Call in subjects assigned to the NO TRAINING GROUP. Read the following information to the subjects:

"YOU HAVE BEEN SELECTED TO RETURN TO THIS ROOM ON _____
_____ AT _____ .

"PLEASE REMEMBER NOT TO DISCUSS THIS PROJECT WITH OTHERS."

Turn the page.

STEP 24

Administer the posttest to the subjects. Follow the same procedures used in the pretest.

Be sure to use the posttest order (Block 1) format.

POSTTEST ORDER (BLOCK 1)

1. Is ARM EXTENSION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...

2. Is ARM EXTENSION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...

3. Is ARM EXTENSION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...

4. Is WEIGHT TRANSFER present in this performance?
Watch the monitor....
Play the scene....

Mark your answer...

5. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

6. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

7. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

8. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

9. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

10. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

11. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

12. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

13. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

14. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

POSTTEST ORDER (BLOCK 1)

15. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

16. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

17. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

18. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

19. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

20. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

21. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

22. IS HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

23. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

24. Is ARM EXTENSION Present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

25. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

26. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

27. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

28. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

POSTTEST ORDER (BLOCK 1)

29. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

30. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

31. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

32. Is HIP/SHOULDER ROTATION present in this Performance?

Watch the monitor....

Play the scene....

Mark your answer...

33. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

34. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

35. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

36. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

37. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

38. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

39. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

40. Is ARM EXTENSION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

41. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

42. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

POSTTEST ORDER (BLOCK 1)

43. Is SIDE ORIENTATION present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
44. Is WEIGHT TRANSFER present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
45. Is WEIGHT TRANSFER present in this performance?
Watch the monitor....
Play the scene....
Mark your answer...
46. Is SIDE ORIENTATION present in this Performance?
Watch the monitor....
Play the scene....
Mark your answer...
47. Is HIP/SHOULDER Rotation present in this performance?
Watch the monitor....

Play the scene....

Mark your answer...

48. Is SIDE ORIENTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

49. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

50. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

51. Is HIP/SHOULDER ROTATION present in this Performance?

Watch the monitor....

Play the scene....

Mark your answer...

52. Is HIP/SHOULDER ROTATION Present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

53. Is WEIGHT TRANSFER present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

54. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

55. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

56. Is HIP/SHOULDER ROTATION present in this performance?

Watch the monitor....

Play the scene....

Mark your answer...

Appendix H: Test Booklet

VTIVMAS

Name _____ Date _____

Sex: _____ Male _____ Female

Status: Please check one.

____ Freshman

____ Sophomore

____ Junior

____ Senior

____ Graduate

Major: Please check one.

____ Physical Education

____ Other _____

WAIT. DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO.

THANK YOU FOR PARTICIPATING IN THIS PROJECT !

You may obtain the results of this test at the conclusion of the project by completing the information listed below.

Name

Mailing Address

PLEASE READ ALONG AS I READ ALOUD.

The following test is being administered to see if you can identify 4 qualitative standards associated with the mature performance of the overhand throw.

A qualitative standard refers to elements related to biomechanically correct technique.

First, you will be told which standard you are to identify. This will be in the form of a question. For example:

"Is _____ present in this performance?" The name of the standard will be inserted in the blank.

The question will be followed by a video sample of the overhand throw.

Each sample will be shown consecutively 3 times and will last approximately 20 seconds. It is recommended that you direct your attention to the monitor prior to each sample. you will be reminded of this throughout the test.

Next, you will mark you answer sheet by blackening the corresponding circle under the headings: YES or NO

YES means the standard was present.

NO means the standard was not present.

WAIT. DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO.

LETS TRY A PRACTICE QUESTION.

You will be shown a sample of the skill striking. The standard you are to identify is HAND DOMINANCE

Watch the monitor.

Is HAND DOMINANCE present in this performance?

Mark your answer.

Remember to mark YES if you think this standard was performed correctly and NO if performed incorrectly.

YES	NO
<hr/>	
0	0

WAIT. DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO.

PLEASE CHECK TO MAKE SURE YOUR NAME IS ON THE ANSWER SHEET.
ASK ANY QUESTIONS BEFORE THE TEST BEGINS.

I will remind you not to talk during this test and please use your test booklet to cover your answer sheet during the test. Once the test has begun, you may not ask any questions.

Now you will be shown the standards you are to identify. This will appear on your screen for approximately 25 seconds. DO NOT RECORD THESE STANDARDS IN ANY MANNER.

YOU MAY CLOSE YOUR TEST BOOKLET AND DIRECT YOUR ATTENTION TO THE MONITOR.

Vita

Kathy S. Eddleman was born on September 26, 1956 in Concord, North Carolina. She attended public school in Portsmouth, Virginia where she graduated from Manor High School in 1974. She attended Radford College and received a B.S. in Health and Physical Education in 1978. She taught physical education in Danville, Virginia elementary and middle schools until 1984. She is currently a graduate teaching assistant at Virginia Polytechnic Institute and State University.

Kathy Eddleman