# DEVELOPMENT AND FORMATIVE EVALUATION OF A PROCEDURAL MODEL FOR THE SELECTION AND REFINEMENT OF PERFORMANCE OBJECTIVES IN PHYSICAL EDUCATION

Dissertation for the Degree of Ph. D.

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DONALD LARRY CARMICHAEL

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# ABSTRACT

## DEVELOPMENT AND FORMATIVE EVALUATION OF A PROCEDURAL MODEL FOR THE SELECTION AND REFINEMENT OF PERFORMANCE OBJECTIVES IN PHYSICAL EDUCATION

By

Donald Larry Carmichael

The purpose of this study was to develop and formatively evaluate a procedural model to be used by teachers for the selection and refinement of performance objectives in physical education. The formative evaluation was designed to answer two questions related to the utility of the procedural model:

1. Can teachers use the procedural model to select and refine performance objectives in physical education (feasibility)?

2. Can teachers effectively select and refine performance objectives in physical education using the procedural model developed as a part of this study (effectiveness)?

The review of related literature yielded specifications for the development of the procedural model in this study. The criteria contained within each section of the procedural model represent a synthesis of the criteria contained in empirical studies and criteria derived from theoretical works dealing with this topical area.

Briefly, this study proceeded as follows: (1) development of a prototype procedural model for the selection and refinement of performance objectives in physical education and a Teacher's Handbook

which operationalizes the model; (2) critical appraisal of the prototype model by a panel of university professors; (3) Tryout I of the prototype Teacher's Handbook by five physical education teachers; (4) implementation of individual and group debriefing techniques to gather data from which to generate revisions; (5) analysis of the Tryout I data; (6) generation of a revised Teacher's Handbook based upon Tryout I recommendations; (7) Tryout II of the revised Teacher's Handbook by the same group of teachers; (8) analysis of the Tryout II data; (9) determination of the utility of the procedural model.

Formative evaluation resulted in no changes in the basic configuration of the prototype procedural model. However, the individual and group debriefing processes used in formative evaluation resulted in the generation of a number of revision hypotheses related to the organization and content of the Teacher's Handbook. Also, the formative evaluation process established the feasibility and effectiveness of the procedural model. The feasibility of the procedural model for selecting and refining performance objectives in physical education was established as a result of the proper implementation of, and teacher attitude ratings toward, the Teacher's Handbook. The effectiveness of the model for selecting and refining performance objectives in physical education was determined by comparing the ratings of prototype and refined performance objectives. A Mann-Whitney U test yielded results indicating the effectiveness of the model ($U = 0$, $p = .004$).

The results of the present study suggest that:

1. The procedural model and Teacher's Handbook, developed as a part of this study, are feasible for selecting and refining performance objectives in physical education.

2. Teachers in physical education can effectively select and refine performance objectives in physical education using the procedural model and Teacher's Handbook.

The procedural model and Teacher's Handbook should undergo further formative evaluation prior to widespread distribution or evaluation of a summative nature. Further development and formative evaluation should consider the following points:

1. The feasibility and effectiveness of the procedural model and Teacher's Handbook should be investigated using a larger number of physical education teachers from various geographical and socio-economic areas.

2. The feasibility and effectiveness of the procedural model and Teacher's Handbook should be investigated using various teacher types, i.e., classroom teachers, teachers of mentally and/or physically handicapped.

3. The feasibility and effectiveness of the procedural model and Teacher's Handbook should be investigated using performance objectives from other than the skill learning area of the psychomotor domain, i.e., cognitive and affective performance objectives in physical education.

4. The feasibility and effectiveness of the procedural model and Teacher's Handbook should be investigated using somewhat different methodology, i.e., (1) the use of a feedback form in place of individual debriefing for data collection where a larger number of teachers are involved, and (2) the comparison of refined objectives to objectives judged to be of satisfactory quality as an alternative means of determining the effectiveness of the procedural model.

Following further development and formative evaluation of the procedural model and Teacher's Handbook, a period of summative evaluation should take place with the object being the provision of comparative information to potential consumers of this educational product.

# DEVELOPMENT AND FORMATIVE EVALUATION OF A PROCEDURAL MODEL FOR THE SELECTION AND REFINEMENT OF PERFORMANCE OBJECTIVES IN PHYSICAL EDUCATION

By

Donald Larry Carmichael

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# DEDICATION

This dissertation is dedicated to

my mother and father

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# CHAPTER I

# OVERVIEW OF THE DISSERTATION

## Introduction

The decade of the 1970's, thus far, has been characterized as the "age of accountability." In the educational arena, accountability represents more than a fad, as taxpayers are requesting that educators justify programs at all levels of the school structure. The field of physical education has been affected by this educational trend, as evidenced by expressions of concern in the current literature and in presentations and discussions at local and national professional meetings (Davis, 1973; Field, 1973; Freischlag, 1974; Melagrano, 1973; Shockley, 1973).

In an effort to communicate the meaning of accountability to educators, several authors have suggested models which, if properly implemented, would yield accountability on the part of an individual or an entire school system (Alkin, 1972; Miller, 1972; State of Michigan, 1972; Vogel, 1972; Wrightstone *et al.*, 1972). A typical example is the model proposed by the State of Michigan (1972), which is depicted in Figure 1.

The specification of performance objectives is an integral part of all these accountability models. This is to be expected since, as Fincher (1972) states, "To deal with the problems of effectiveness,

Educational Accountability Model

I. Goals

II. Performance Objectives

III. Needs Assessment

IV. Delivery System

V. Testing and Evaluation

VI. Recommendations

Figure 1 The State of Michigan Accountability Model

the definition of objectives must be one of the inputs..." (p. 736). Objectives must be expressed if communication is to take place. Initial attempts toward educational accountability often have involved the generation of performance objectives by subject area teachers. Many teachers have experienced various degrees of failure and frustration resulting, largely, from a lack of expertise and time to adequately complete the task (Cremer, 1970; Lindvall, 1964; Popham, 1969; Sullivan, 1969).

Recently, various agencies have recognized the problems of teachers involved in the generation of performance objectives in addition to their normal workload. As a result, attempts have been made to develop "banks" or resource files of objectives from which teachers may choose. One such agency is the Instructional Objective Exchange (IOX) of Los Angeles, California (Popham, 1970). The State of Michigan has attempted to provide a similar service by generating minimal performance objectives in physical education and health education (Michigan Department of Education, 1973). The Upper Midwest

Regional Interstate Planning (UMRIP)[1] has initiated a cooperative effort to develop performance objectives in physical education. The Programmatic Research Project[2] has developed a classification of objectives for various performance areas and identified sequential subordinate objectives leading toward those terminal skills in the psychomotor area.

As a result of such large-scale efforts, many teachers are faced with the problem of examining and choosing from numerous performance objectives, those which are suitable for use in their individual situation. The problem of making these critical judgments is confounded by the fact that guidelines for selecting appropriate objectives are not clearly formulated, in most instances. Therefore, it appears that teachers are being asked to generate or select and modify objectives for their programs in the absence of the needed expertise and/or resources to do this task effectively and efficiently.

## Need for the Study

Systematic procedures and criteria by which teachers may select, evaluate, and revise performance objectives generally are lacking. This void seriously reduces: 1) the probability that performance objectives will be improved by developers based upon teacher feedback;

---

[1]Rob L. Shanks, Director. A sub-committee of UMRIP, the Four State Physical Education Assessment Committee, has identified performance objectives, K-12, in physical education. These performance objectives are being printed and distributed to all state departments.

[2]Dr. Janet A. Wessel, Director. Michigan State University, East Lansing, Michigan.

and 2) the likelihood that teachers will attempt to select or revise objectives for their own use.

Physical educators need a structure and a set of decision criteria by which they may select and evaluate performance objectives. Teachers need to be able to examine objectives, apply decision criteria, identify deficiencies, and revise the objectives based on this evaluation (Moxley, 1972). Such a process would facilitate intelligent adoption of objectives and provide curriculum developers with feedback which would be useful in revising prototype performance objectives.

## Purpose of the Study

The purpose of this study was to develop and formatively evaluate a procedural model to be used by teachers for the selection and refinement of performance objectives in physical education.

## Methodological Overview

The general procedures followed in this study are listed below:

### Prototype Model Development

The initial task was to develop a procedural model which explicates a sequence of tasks, decision rules, and criteria for refining performance objectives.[1]

### Formative Evaluation of the Model

The second major objective was to submit the prototype model to formative evaluation involving a tryout and debriefing procedure designed to yield information for revision.

---

[1]This procedural model was operationalized into a Handbook for the Selection and Refinement of Performance Objectives in Physical Education, hereafter referred to as the Teacher's Handbook.

Utility of the Model

Third, the utility of the resultant procedural model was determined by investigating the following research questions:

1. **Can teachers use the procedural model to select and refine performance objectives in physical education (feasibility)?**

2. **Can teachers effectively select and refine performance objectives in physical education using the procedural model developed as a part of this study (effectiveness)?**

## Significance of the Study

If procedures for the selection and refinement of performance objectives can be developed, formatively evaluated, and demonstrated to be feasible and effective, those procedures will have widespread applicability in physical education. Not only individual teachers may profit from such a model, but large agencies and institutions may become more systematic in the development and revision of performance objectives by modifying characteristics of this model to guide and structure feedback data.

## Limitations

The results of the present study should be considered with the following possible limiting factors in mind:

1. The five teachers employed in this study for the purpose of formative evaluation were an available sample, rather than being randomly selected. (The teachers involved are described for the convenience of the reader in Appendix A.)

2. The performance objectives used in this study were selected because they were prototype performance objectives in physical education (a sample of these objectives is included in Appendix B for the convenience of the reader).

3. The objectives used in this study were limited to skill learning objectives in the psychomotor domain.

4. There exist unique, uncontrolled interactive contributions of the investigator, the teachers and the children involved in this study which cannot be described or defined.

## Definition of Terms

For the purposes of this study, the following definitions are suggested:

1. Accountability - A negotiated relationship in which the participants agree in advance to accept specified rewards and costs on the basis of evaluation findings as to the attainment of specified ends (Alkin, 1972).

2. Debriefing - A formalized procedure involving face-to-face interaction, structured by an agenda, in which the investigator obtains information from teachers about deficiencies in the procedural model and how to remediate these deficiencies (Abedor, 1971).

3. Enabling Objective - The component actions, knowledges, and/or specific skills which the student must manifest if he is to attain the terminal objective. They bridge the gap between where the student is and where he should be upon completion of instruction (Ammerman and Melching, 1966).

4. Flowchart Model - A conceptualization in the form of a graphic analog which represents a real-life situation (Silvern, 1969).

5. Formative Evaluation - Evaluation which takes place during the development of a product, thereby permitting intelligent changes to be made. The deficiencies and strengths of an intermediate version are identified and appropriate adjustments are made (Scriven, 1967).

6. Performance Objective - A terminal performance objective and its associated enabling objectives. It may be used synonymously with "behavioral objective" or "instructional objective" as commonly defined by such authors as Mager (1962) or Burns (1972).

7. Preliminary Model - The model prescribed for the selection and refinement of performance objectives based upon the review of the literature (the first draft of the procedural model which was developed as a part of this study).

8. Prototype Objective - A performance objective in first-draft form which has yet to be subjected to teacher evaluation.

9. Refinement - The improvement of an instructional objective as a result of applying stated criteria for evaluation. When a performance objective is revised or judged to conform to criteria, it is considered to be "refined" (Rahmlow, 1971).

10. Terminal Objective - A relatively specific (but more general than an enabling objective) statement of learning outcomes expressed from the learner's point of view. It describes a skill at the level

required for effective use in life (functional) (Ammerman and Melching, 1966; Burns, 1972; Tyler, 1964).

## Organization of the Dissertation

In Chapter II, the literature related to the development and formative evaluation of a procedural model for the selection and refinement of performance objectives is reviewed and summarized.

In Chapter III, the preliminary model specifications, based upon the literature review and professional interaction, are explicated.

In Chapter IV, the methods and procedures used in the formative evaluation of the procedural model are outlined in detail.

In Chapter V, the results of this study are presented and discussed.

In Chapter VI, this study is summarized, conclusions are drawn, and recommendations for further research are provided.

# CHAPTER II

# REVIEW OF RELATED LITERATURE

## Overview of This Chapter

In Chapter I, the need for systematic procedures to select, evaluate and refine performance objectives in physical education was cited. In this chapter, literature related to the generation of procedures to meet that need is reviewed by topic.

The review of literature related to the topic of interest in this study was guided by a number of broad questions. The implications of each question for this study are systematically interpreted in this chapter.

## Questions Guiding the Review

The review of related literature was guided by a number of general questions:

1. What is the rationale for the specification of performance objectives?

2. What do teachers need in order to select and refine performance objectives?

3. What should be the form of procedures designed to help teachers use performance objectives?

4. How should these procedures, once developed, be evaluated?

5. Are there empirical studies which closely relate, theoretically or methodologically, to the present study?

## An Underlying Assumption

This study is based on the premise that performance objectives should be stated and used in the teaching process; however, it should be recognized that the literature is not completely supportive of this assumption (Popham, 1970). Since the initial interest in the writing of performance objectives, which was precipitated largely by Robert Mager's (1962) book, considerable debate has ensued concerning the advantages and disadvantages of using performance objectives. Although various authors have argued against the specification of objectives (Eisner, 1967; Hogben, 1972, 1973; Raths, 1971), many authors have supported this practice as being sound (Ammerman and Melching, 1966; Baker and Popham, 1973; Burns, 1972; Davis *et al.*, 1972; Esbensen, 1971; Krathwohl, 1965; Lindvall, 1964; Mager, 1962, 1968; Michael and Metfessel, 1967; Paulson and Nelson, 1969; Rahmlow, 1971; Tyler, 1964).

The position of this investigator is that the specification of intended learning in the form of performance objectives can be a valuable tool for planning, evaluating, improving and communicating the intents of instruction. This position is supported by Lindvall, who states:

> ...the needs of the teacher when he is planning his day-by-day instructional procedures are the same as his needs when he is developing his plans for evaluation. He must center his attention on what the pupils should be able to do after they have had the learning experience. Only on the basis of this type of consideration can the proper experience be planned. The result of this type of thinking has been an emphasis on clearly stated behavioral objectives as a key element in any curriculum plan.
>
> (Lindvall, 1964, p. 4)

Krathwohl also supports this position when he says, "...specifying educational objectives as student behaviors seems to be a useful and powerful approach to the analysis of the instructional process" (Krathwohl, 1965, p. 83). The latter statement clearly supports the inclusion of performance objectives in any scheme of educational accountability. Perhaps an amusing analogy, offered by Paulson, will further support the position taken in this paper and summarize this discussion:

> To illustrate, let me tell you how I learned to play pool. I seem to have a natural preference for a game called "rotation," in which it is not necessary to call one's shots, and an important factor in scoring is the amount of kinetic energy one can impart to the cue-ball. I found this game satisfied a certain personal need after a frustrating day at the office. However, even with frequent playing, my proficiency didn't seem to improve. My father has a strong preference for pocket billiards, and he told me one time that I would never learn to play pool decently until I called my shots--predicted the pocket a ball would fall in before I shot. I must admit that calling my shots made me uncomfortable - it still does. But I was amazed at the difference it made in my game. Both successful and unsuccessful shots provided useful information. I learned that some combinations are certain to fail, but others are risky; that it was important to hold the cue in a certain way, but that one of my cues was crooked, and should be reserved for guests. I even learned to compensate for the warp of the table and the treachery of the cushions. (Paulson, undated, p. 5)

## The Use of Models

Examination of the literature related to any topic in education today, especially at a theoretical level, very likely will disclose that authors are proposing models of, or for, that topic, i.e., accountability, evaluation, curriculum development or research to practice. Several authors have explicated the value of representing concepts in the form of models (Cookingham, 1970; Maguire, 1968;

Saslow, 1970; Taylor and Maguire, 1967; Ward, 1966). The following reasons for the use of models cited by Saslow seem to be representative of this group of authors:

> Among the values of referring to a model, one may include the power of being able to check one's own procedures against a set of systematic, organized, recommendations, and the professional understanding of the procedures involved which has been gained through research on the model itself. Finally, working within established models, when they are applicable, simplifies communication with colleagues and sponsors. (Saslow, 1970, p. 38)

There are some problems associated with the use of models for communicating ideas. Cookingham (1970) states that the term "model" has many different meanings in educational discourse and suggests that the use of qualifiers accompanying the word "model", i.e., "scale model", "theoretical model", or "procedural model", is the best way to facilitate clarity of communication. Further, Ward (1966) emphasizes the distinction which should be made between a model "of" something and a model "for" something.

An attempt has been made to enhance communication by representing these models in graphic analog or flowchart form. Flowcharting is done when the topic of interest lends itself readily to this treatment. However, the variety of symbols and styles used in flowcharting has resulted in confusion in meaning and interpretation. Attempts have been made to standardize the graphic language used in flowcharting to improve communication (Silvern, 1969).

Perhaps the most serious criticism of models in education is that developers do not provide guidelines for their use (Proger, 1971). Irrespective of the clarity of thought represented by a model, it must be used if it is to fulfill the purpose for which it was designed.

Proger (1971) characterizes a model which is not used due to a lack of guidelines as having become "functionally incompetent", even though it may be theoretically sound.

## Formative Evaluation

There is extensive support for formative evaluation as an integral part of the development process of any educational product prior to widespread distribution or evaluation of a summative nature (Alkin, 1970; Briggs, 1970; Bruner, 1963; Cronbach, 1963; Cunningham, 1971; Hamreus, 1969; Scriven, 1967; Sorenson, 1971; Tyler, 1950). Scriven (1967) is credited with coining the term "formative" evaluation; however, several authors have talked about the same idea in different terms. Sorenson provides a description which is representative of the meaning of this concept:

> This concept holds that part of the effort and resources ordinarily expended in developing and using any instructional program, whether lecture series, syllabus, textbook, workshop, or training film, should be devoted to testing out and improving that program, particularly during the course of its development, to ensure that the program will work with a particular group of students. (Sorenson, 1971, p. 13)

A simple, step-wise procedure for formative evaluation that has applicability to the present study at the theoretical level is: (1) build a prototype; (2) try out the prototype; (3) obtain evidence from the tryout; (4) modify the prototype where necessary; and (5) repeat the revision-test-modification cycle, if possible (Hamreus, 1969). These steps serve as a model for the formative evaluation of the procedural model developed in this study.

The issue in question for this study clearly is not whether the prototype educational product should undergo formative evaluation but,

rather, what is the recommended methodology by which this may be accomplished? Tyler not only reinforces the concept of "formative evaluation for the improvement of instruction", but also directs comments which provide specifications for the present study when he states:

> ...as you work with objectives and with your efforts to teach them you frequently have a basis for the re-definition of your objectives. As you see what really is possible, you may see more clearly the kinds of things the pupils need in addition to those that you thought of in your original planning. The process of clarifying goals, then working toward them, then appraising progress, then re-examining the goals, modifying them and clarifying them in the light of the experience and the data is a never ending procedure. (Tyler, 1964, p. 83)

## Formative Evaluation Methodology

The approach described by Tyler (1964) outlines the suggested methodology for the teacher in "trying out" an objective as well as for the tryout and revision of the model itself. A number of authors have attempted to contribute to the improving technology of evaluation by reviewing evaluative studies and have offered methodological suggestions based upon synthesis of this information (Abedor, 1972; Caro, 1971; Cooke and Duncan, 1972; Sanders and Cunningham, 1972; Stufflebeam, 1967; Welch, 1969; Westbury, 1970).

### Research by Abedor

A study describing the development and validation of a model for the formative evaluation of an educational product (Abedor, 1972) was of particular interest. This study is described as being, "...illustrative of the methods appropriate for the empirical analysis of objectives" (Sanders and Cunningham, 1972, p. 10).

This study was conducted in four phases:

1) Design of the model based on literature review

2) Critical review of the prototype model by "experts"

3) Develop a revised model based on feedback which featured a small group tryout and debriefing procedure as the main method of identifying problems and developing revision

4) Empirical test of the revised model.

Figure 2 depicts the model for formative evaluation developed and validated by Abedor.

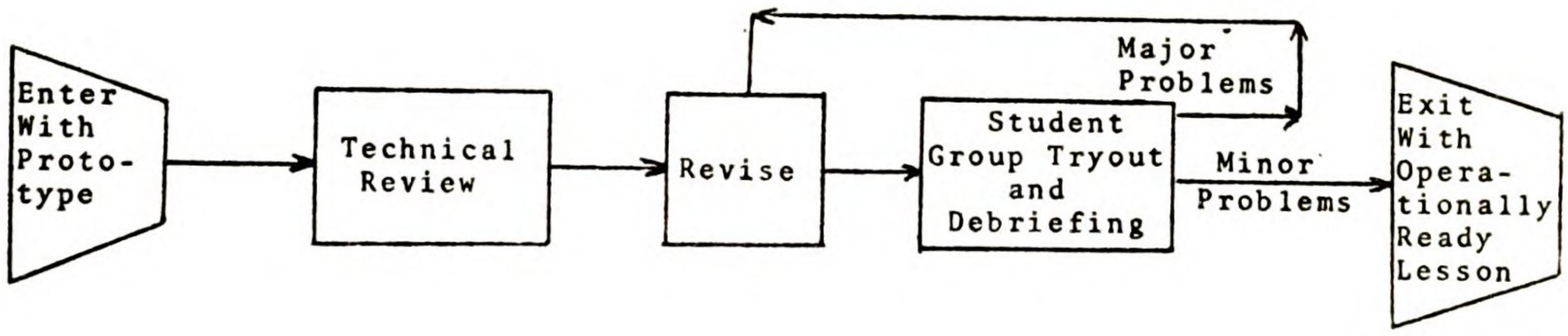



Figure 2 A Model for Formative Evaluation (Abedor, 1972).

This model is exemplary, in that it calls for a small sample, iterative approach to the tryout and revision of prototype educational products (Cronbach, 1963; Sanders and Cunningham, 1972; Sorenson, 1971) and incorporates the structured debriefing approach to the gathering of data upon which to base revision hypotheses. Figure 3 depicts the group tryout and debriefing technique used by Abedor.

This debriefing approach has been used successfully in the primary stages of at least one curriculum development project, the Programmatic Research Project at Michigan State University (Vogel and Carmichael, 1972). This approach has been identified as an extremely

valuable and sensitive data gathering technique (Meyen, 1973; Sanders and Cunningham, 1972).

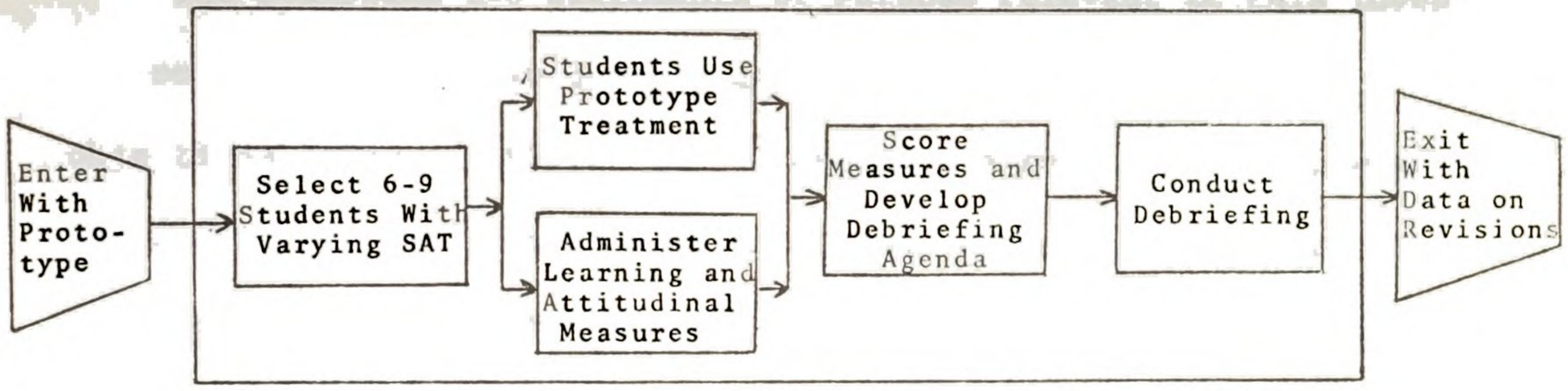



Figure 3 A Student Group Tryout and Debriefing Technique (Abedor, 1972).

The study by Abedor (1972) has provided some of the information needed to answer three questions which are of importance in the present investigation:

1. How to identify discrepancies in a prototype via data collection
2. How to analyze these data and develop revision hypotheses
3. How to design, integrate and evaluate the revisions.

Consequently, the Abedor (1972) study is cited as the key source upon which the methodology employed in the present study was based.

## Related Empirical Studies

In this section, studies directly related to the selection and refinement of performance objectives are considered. Since the process of selection and/or refinement of an objective necessitates that a judgment of quality be made regarding an objective, the criteria employed in making such decisions were of particular interest as possible information for inclusion in the procedural model.

Research by Ammons

The following two statements of purpose relevant to this investigation are contained in a study concerned with the quality of objectives (Ammons, 1964): (1) determine the relationship between the quality of the process used to develop educational objectives and the quality of objectives resulting from use of the process, and (2) identify factors other than process which may influence the quality of the objectives. The criteria used to judge the objectives in this study are as follows:

1. Validity - Do objectives accurately reflect the aims of the controlling agency?

2. Appropriateness - Do objectives seek to develop behaviors appropriate for the learners for whom the objectives are proposed?

3. Feasibility - Are objectives practical in the given situation?

4. Precision - Are objectives clearly enough stated to give the proper guidance in selecting learning situations and evaluation techniques?

5. Consistency - Will the achievement of any one objective make the achievement of any of the others impossible or doubtful?

6. Comprehensiveness - Do objectives reflect all the aims of the board? (Ammons, 1964, p. 453)

Ammons concluded (it is not explained how) that teachers could not represent accurately the quality of objectives using two of the criteria--precision and consistency. It is suggested that the reason for this (if it were true) could have been the lack of directions and examples (e.g., decision aids) supplied to aid the teachers in making these judgments.

Research by Taylor and Maguire

Teachers, curriculum writers and subject matter experts were asked to rate eighteen broad objectives using a twenty-seven item, bipolar adjective scale to determine what differences, if any, exist among the perceptions of broad objectives of a science curriculum. (Taylor and Maguire, 1967). This semantic differential instrument employed several seven-point bipolar scales. The fact that the three groups were not significantly different in their perceptions of the objectives is not as important to this study as the categories of adjectives used in the rating instrument. These categories suggest possible criteria which could be used to judge the quality of objectives.

Research by Maguire

Teachers were asked to evaluate a group of objectives on a set of thirty bipolar adjectival scales in an investigation to determine how certain classroom decisions about objectives are made (Maguire, 1968). These scales were selected to describe various aspects of the value of educational objectives. Based upon a sample of two different groups of teachers, four common value components were found, namely: "Subject-Matter Value, Motivational Qualities, Ease of Implementation, and Statement Properties" (Maguire, 1968, p. 77). These components were defined as follows:

1. Subject-Matter Value - value to the discipline
2. Motivational Quality - prediction of the student's reaction to the objective

3. Ease of Implementation - amount of difficulty that the teacher would have in implementing the objective

4. Statement Properties - precision of the statement

These value components were considered for possible inclusion in the procedural model as selection criteria. An additional point having pertinence to the present investigation was made regarding the rationale for using only teacher ratings of objectives in the study:

> The present study was directed particularly toward the judgments of the group of experts who are most immediately concerned with the implementation of the curriculum at its point of contact with the student -- the teacher. It is contended that teachers' assessments of curricular objectives can control the impact that a curriculum has on a student. (Maguire, 1968, p. 68)

This statement indicates the impact of the ratings of objectives by teachers upon the curriculum and the students. It is implied that these ratings are made whether or not appropriate criteria are applied in any systematic way. Maguire suggests that there are several dimensions of value that must be considered when objectives are assessed and that some of these dimensions (e.g., motivational quality) are often overlooked.

Research by Petro

A recent study attempted to determine the usefulness of derived instructional objectives by: (1) demonstrating the feasibility of a model for the derivation of instructional objectives of technical accounting programs, and (2) establishing a set of instructional objectives which describe desired student behavior and are suggestive of appropriate learning sequences (Petro, 1969). A panel of post-high

school accounting instructors was asked, "Can you understand the statement well enough to describe some sort of instructional activity (experience) which might lead to the accomplishment of the objective?" (Petro, 1969, p. 45). Although this statement suggests one criterion which could be used to judge the quality of an objective, a "yes" or "no" response to this question, alone, is viewed as being insufficient information with which to formulate revision hypotheses.

Research by Cremer

Behavioral objective planning guides for writing objectives at the six levels of Bloom's taxonomy (cognitive) were developed as a part of a recent study found to be representative of many in terms of the criteria employed to judge the quality of objectives (Cremer, 1970). Investigated was the ability of groups to write behavioral objectives with and without the use of behavioral objective planning guides. The criteria used by a six member panel of judges to evaluate the quality of the objectives were those suggested by Mager (1962): conditions, behavior and standards. The judges rated each objective "yes" or "no" with regard to acceptability according to these criteria. The behavioral objectives planning guide was found to be effective for assisting teachers in writing behavioral objectives. The fact that criteria developed by Mager (1962) were employed widely in studies of this type suggested that they would be of value in formulating the procedural model for the present study. However, the method of rating the objectives used in the Cremer study (a "yes" - "no" response) is adjudged to be too gross for the identification of deficiencies and the formulation of revision hypotheses.

## Summary

The summary is organized as a series of statements related to each of the questions which guided the review of related literature.

1. Performance objectives should be stated and used in teaching. The position was taken that performance objectives can be a powerful tool in the instructional process.

2. Teachers need procedures by which they may select, evaluate and refine performance objectives in the field. The generation of procedures and guidelines to help teachers deal with performance objectives is suggested. Criteria are available and models have been formulated, but these aids have not been synthesized and presented in a format that can be used by the teacher.

3. The recommended procedures for selecting and refining performance objectives should be presented in the form of a procedural model. Models represent the theoretical ideas which are enacted through implementation. The user should be provided with guidelines for the use of the model. Lack of guidelines has been cited as one of the shortcomings of many models in education. The prototype model should be depicted in flowchart form.

4. The prototype model should undergo formative evaluation procedures which are appropriate for a product during the initial stages of development. Further formative evaluation should take place prior to widespread distribution or evaluation of a summative nature.

5. Several studies dealing with the quality of objectives were reviewed. These studies suggested a number of criteria for inclusion in the procedural model.

In Chapter III, the procedural model for the selection and refinement of performance objectives in physical education is presented. This represents the synthesis of the literature into a procedural model which is depicted in flowchart form and explained and documented in the appropriate sequence.

# CHAPTER III

# THE PROCEDURAL MODEL

## Introduction

The specification of a procedural model for the refinement of performance objectives in physical education is consistent with the needs and recommended procedures of education today. Moreover, once the procedural model is developed, a period of formative evaluation clearly is recommended before the model would receive widespread distribution or evaluation of a summative nature. In this chapter, the procedural model for the selection and refinement of performance objectives, depicted at the first level of detail in Figure 4, is explicated.

## Goals of the Model

This procedural model provides criteria to guide the teacher in answering the following questions:

1) Do I want to use this objective in my program? (Selection)

2) Is this a proper objective in terms of the desirable properties of a performance objective? If there are deficiencies, how can I correct them? (Examination)

3) Given a proper objective which has been taught, are there modifications which would make this objective more appropriate? (Tryout)

These three questions correspond to: (1) the three stages of implementation of a behavioral objective which are recommended by

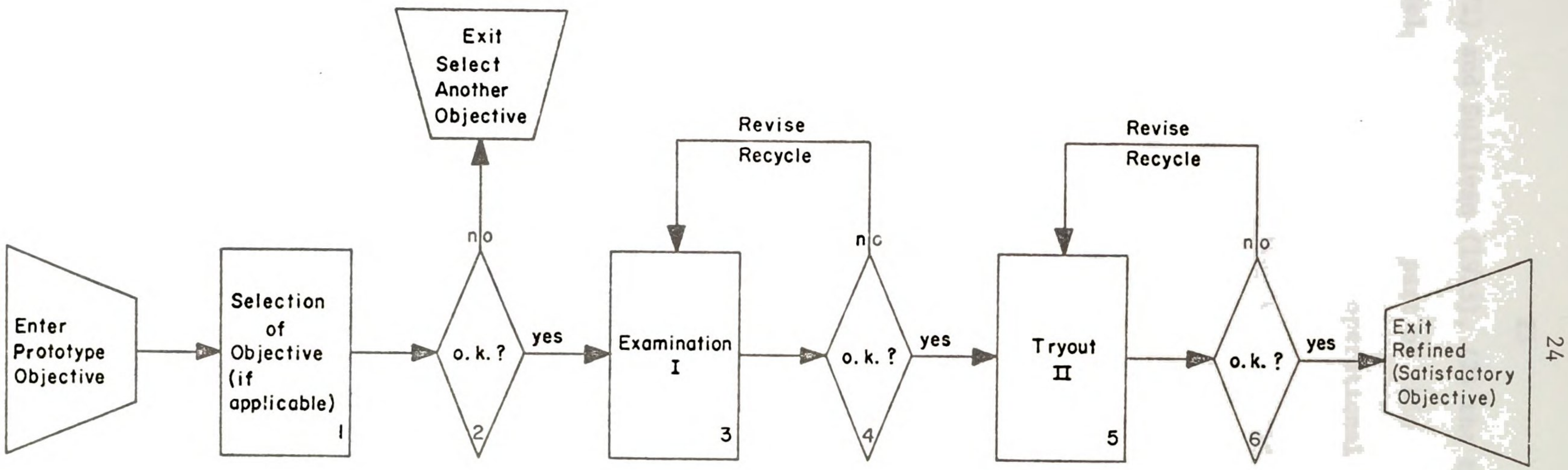



Figure 4 A Procedural Model for the Selection and Refinement of Performance Objectives in Physical Education at the First Level of Detail

Kapfer (1971) and Sullivan (1973), (2) the three sections of the procedural model developed as a part of this study, and (3) the sections of the Teacher's Handbook which operationalize the procedural model.

## Intended Audience

**Although this procedural model may be used appropriately by various individuals and/or groups, hereafter the intended users will be identified as teachers in one of the following two categories:**

1) Those writing performance objectives

2) Those selecting performance objectives from an available source or "bank" of objectives.

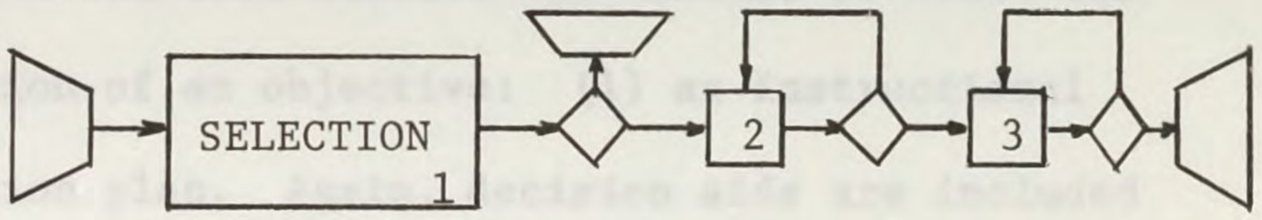
The model itself is adaptable, in that a teacher *could* enter at Section II (examination), generate a prototype objective, go back to Section I (selection) to check the desirability of the objective, and then proceed to Section III (tryout).

In the next segment of this chapter, the procedural model is overviewed by sections. This overview is followed by a more detailed schematic representation and a discussion of the stepwise procedures and criteria included in this model.

## The Procedural Model in Brief

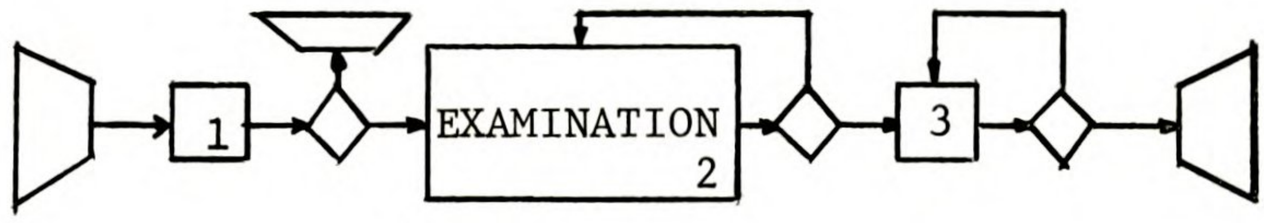
The three sections of the procedural model are presented below as they are depicted in Figure 4. Each one is discussed briefly and related to the other sections of the model. The intention is for the reader to conceptualize the overall approach being taken in this presentation before considering, in detail, the criteria specified in each section.

Section I - Selection




This section is most appropriate for the teacher who is selecting objectives from an available source. To assist in making such a selection, appropriate criteria should be employed. Criteria are provided in this section to assist the teacher in making selection decisions. No relative weightings for these criteria are suggested, but each teacher should establish guidelines for accepting objectives based upon positive response(s) to the criteria posed. Teachers who are writing performance objectives may also use these criteria to evaluate their objectives.

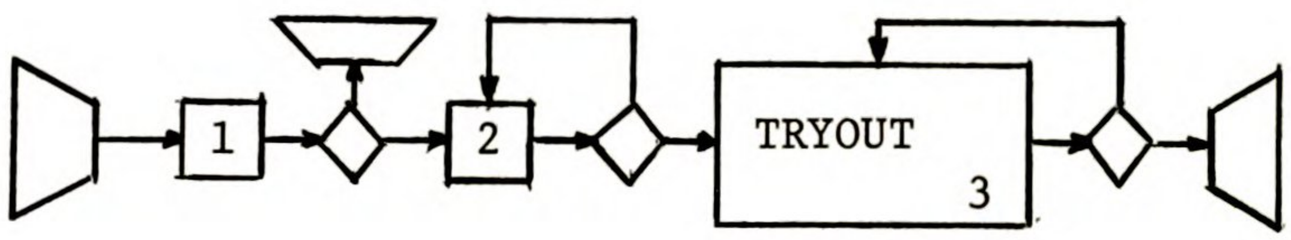
Section II - Examination




Following the selection of an objective(s), the teacher should examine it closely prior to teaching. Section II presents criteria for the examination of objectives to identify their important components and qualities. This section aids in discovering deficiencies in an objective and provides decision aids to assist the teacher in deriving alternatives which will improve the objective. These criteria are appropriate for the examination of any objective, whether teacher-generated or selected from an objective bank.

This section of the model also directs the teacher to write two aids for the implementation of an objective: (1) an instructional plan, and (2) an evaluation plan. Again, decision aids are included to assist the teacher in this task.

## Section III - Tryout




The true test of an objective is whether or not it facilitates learning by the students for whom it was written. In the Tryout Section, criteria are presented which are used to evaluate the objectives after the associated learning experiences have taken place.

The tryout procedure directs the teacher to employ the written instructional and evaluation plans with students. The criteria in Section III are applied to the objective after teaching for the time allotted in the plan.

Following Tryout, responses are used to refine or revise the objective statement. The resulting objective is the product of applying the criteria contained in the procedural model and, as such, is considered to be of acceptable quality (as judged by that teacher) and appropriate for the intended student population.

This brief orientation to the specifications of the procedural model has been presented as an overview. In the discussion which follows, each section of the model is explained in detail and the

criteria for evaluating the objectives are presented with supporting documentation.

## The Procedural Model in Detail

A more detailed schematic representation of the procedural model developed as a part of this study is presented in Figure 5. The discussion which follows will proceed section by section through the model. However, in practice, one should view this model as being capable of having multiple entry points, adaptable to a variety of circumstances and suitable to application, by sections, over an extended period of time.

### 1.0 Selection

This section is best characterized as a checklist against which one may evaluate a prospective objective. The question of importance is, "Do I want to include this objective in my program?" An accept-reject decision must be made with regard to each objective evaluated. No strict guidelines for when to reject an objective are offered the user of the model;[1] however, one or more negative responses to the criteria would certainly indicate that the personal weighting assigned to each criterion would be involved quite heavily in making the final decision. The criteria for selection included in this procedural model are as follows:

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[1]For a systematic means of establishing priorities concerning objectives over a number of groups, see Stake, 1972.

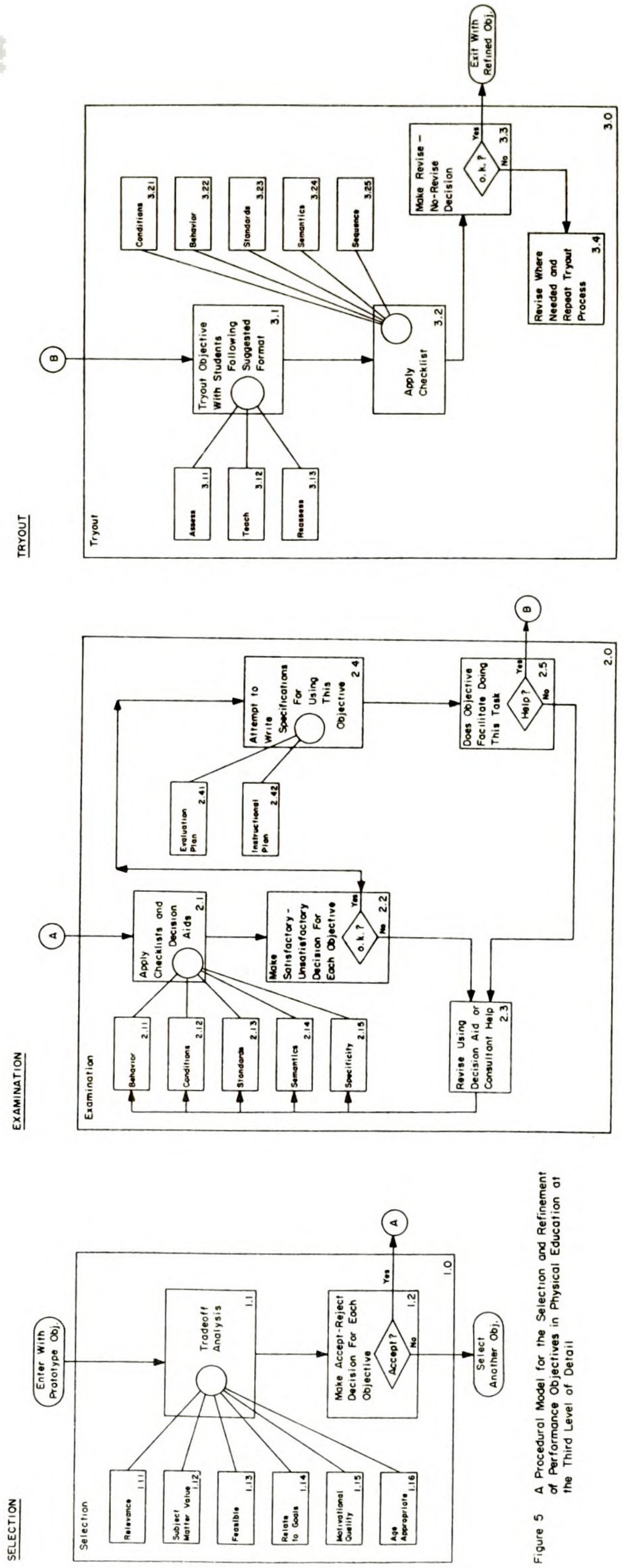


Figure 5 A Procedural Model for the Selection and Refinement of Performance Objectives in Physical Education at the Third Level of Detail

SELECTION

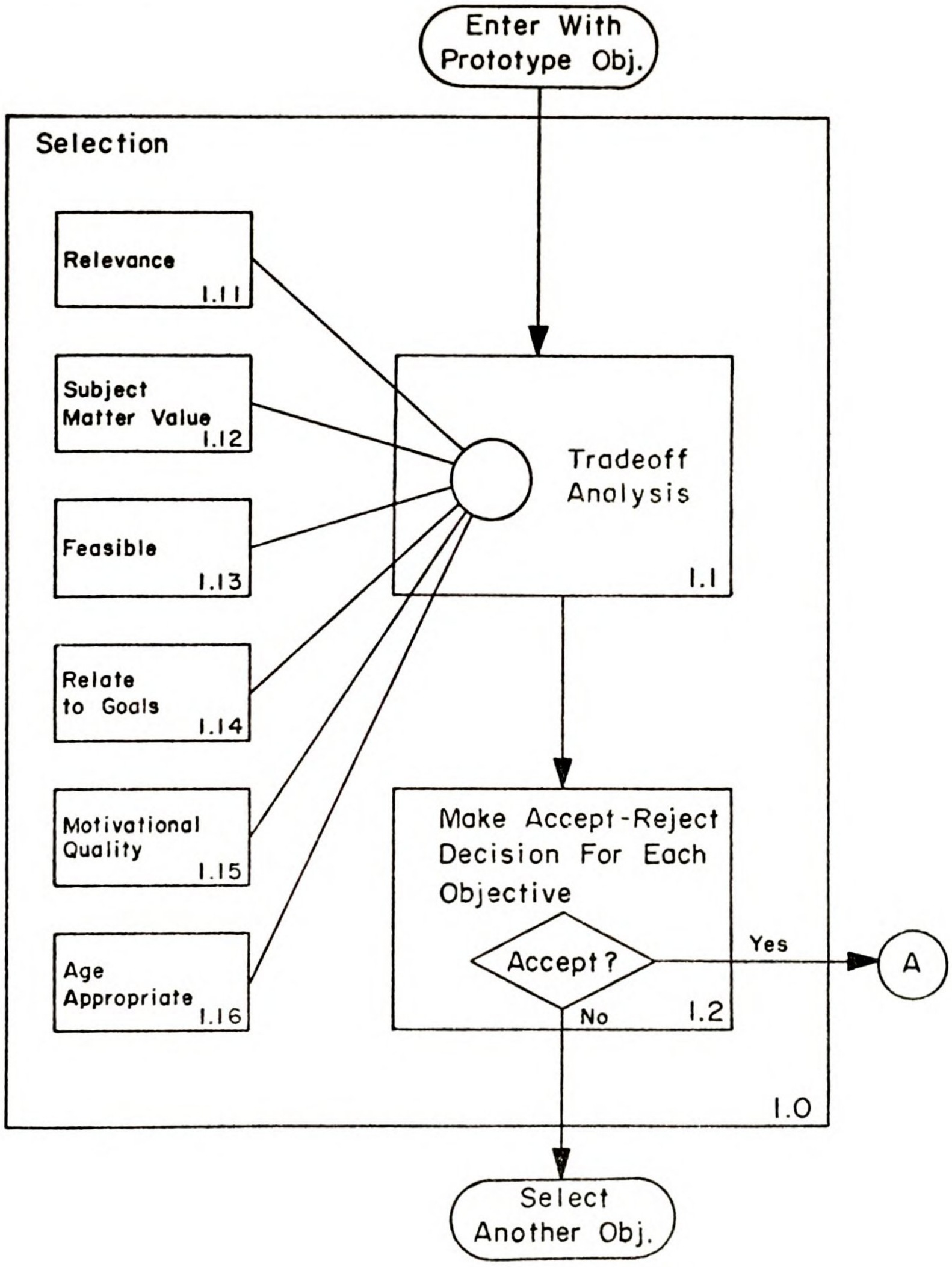


Figure 5 A Procedural Model for the Selection and Refinement of Performance Objectives in Physical Education at the Third Level of Detail (continued)

EXAMINATION

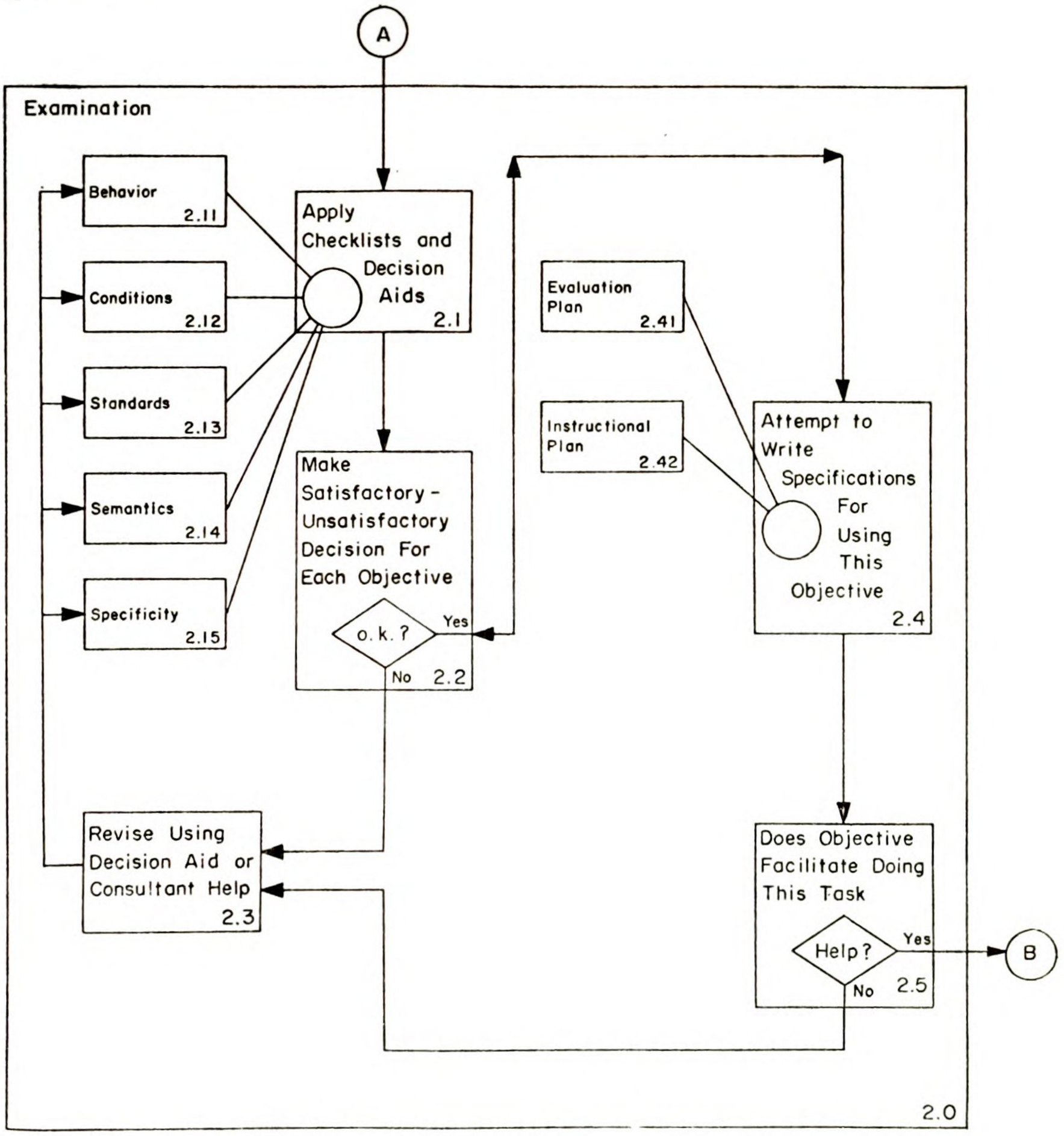


Figure 5 (continued)

TRYOUT

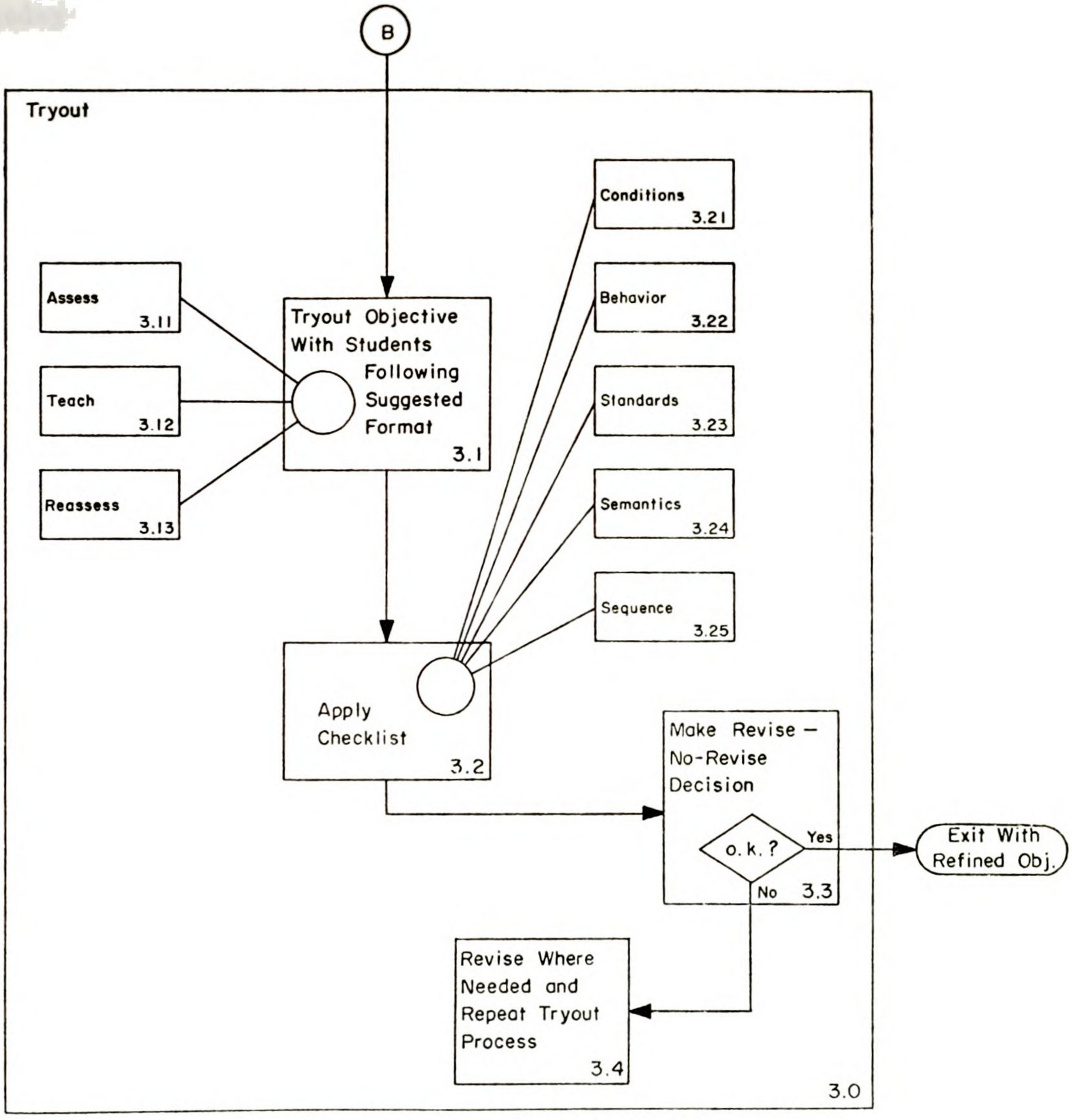


Figure 5 (continued)

## 1.11 Relevancy

One of the most common expressions heard in educational circles today is the plea for "a meaningful and relevant educational experience." Moxley (1972) considers the relevancy of an objective by asking, "What will happen of value to the student, now and in the future, as a result of achieving this objective?" A number of authors have emphasized the fact that this issue must be considered when selecting education objectives (Davis *et al.*, 1972; Kapfer, 1971; Mager, 1968; Michael and Metfessel, 1967; Moxley, 1972; Sanders and Cunningham, 1972; Taylor and Maguire, 1967; Tyler, 1964). Davis *et al.* (1972) attempt to insure relevance by urging that consideration be given to the situation in which the learned behavior is to be demonstrated. To insure relevancy, Mager (1968) suggests the application of task analysis to the perceived situation in which the skills will be applied.

## 1.12 Subject Matter Value

The vast amount of information which could be presented in an educational program necessitates a careful analysis of each prospective component. A criterion worthy of consideration is the amount of subject matter value an objective possesses (Davis *et al.*, 1972; Dell, 1972; Kapfer, 1971; Maguire, 1968; Moxley, 1972; Taylor and Maguire, 1967; Tiemann, 1969; Tyler, 1964). That is, one must question the importance, immediate and beyond, of an objective in relation to the physical education of students. Mager (1972) suggests a very simple test, the "Hey, Dad!" test, to detect a trivial or unimportant objective. This test depicts a student saying, "Hey,

Dad! Know what I'm learning in school?" The substance of a particular objective is then related. If Dad's response could reasonably be "so what!", one might question the importance of this objective.

Every teacher must be comfortable with the components of the program he or she is responsible for teaching. This criterion suggests that the teacher ask the question, "Is this objective acceptable in terms of my personal philosophy of what a quality physical education program should contain?" Such a question is important, in that it prompts the educator to do a degree of "soul searching" regarding philosophical beliefs. Whether stated as an estimate of the desirability of the objective (Ammons, 1964) or a priority rating in light of the personal judgments of the teachers involved (Michael and Metfessel, 1967), this criterion fosters a professional assessment of the objective by the teacher.

1.13 Feasibility

An objective being considered for inclusion in a program should be evaluated in light of its practicality in the given situation (Ammerman and Melching, 1971; Ammons, 1964; Michael and Metfessel, 1967). Constraints such as facilities, equipment, time, and adequate assistance to properly teach certain content areas should be considered in the selection process.

1.14 Direct Relationship to Goals

The objectives of any program should be selected based upon the degree to which they contribute to the goals (stated or implied) of the program, school, district, and/or state (Ammons, 1964; Burns,

1972; Lee and Merrill, 1972; Lindvall, 1964; Tiemann, 1971; Tyler, 1964). This insures that the instructional program will reflect the values expressed by those instrumental in the formulation of the goal statements.

### 1.15 Motivational Quality

The degree to which the accomplishment of an objective will be motivating to the intended student group should be considered as a part of the selection process (Kapfer, 1971; Maguire, 1968, 1969; Moxley, 1972; Popham and Baker, 1970; Yelon, 1971). Although the issues of relevancy and subject matter value have a strong overlap with motivation, this criterion encourages the teacher to assume the student's point of view. Will this objective be adopted by the students, or only by the teacher (Kapfer, 1971)? Yelon (1970) recognizes the importance of the motivational aspect by proposing that teachers should attempt to determine student interest in a subject area following instruction and use this information in subsequent planning. Maguire (1969) suggests that the motivational quality of an objective is overlooked too often as an important criterion for the selection of objectives.

### 1.16 Age Appropriateness

The physical, mental, social, and emotional characteristics of the students should be considered as a part of the objective selection process (Ammons, 1964; Criak, 1971; Michael and Metfessel, 1967; Tyler, 1964). Although this may seem obvious, a surprising number of teachers base what they do in a program on the "power of

tradition" more than on any other factor (Ammons, 1964). Attention to this criterion prompts the teacher to think about the present status of the student group of interest. Hopefully, objectives which are incongruent with the level of student development will be rejected for use in the program.

### 1.1 "Tradeoff" Analysis

After an objective has been evaluated using the above mentioned criteria, the teacher must analyze the judgments which were made. Strict guidelines for making an accept-reject decision are not supplied as a part of this procedural model, since this decision ultimately will be based upon the relative weightings of importance attached to each criterion by an individual teacher. However, it is suggested that, in view of the vast amount of material which could be included in a program, an objective which is rated negatively by one or more of the criteria should be placed in a reject or "reserve judgment" category.

### 1.2 Decision Point

The teacher finally must make the accept-reject decision about each of the objectives being considered by using the selection checklist. Objectives judged to be unacceptable are discarded. Objectives which are judged to be acceptable need to be more carefully examined for quality, utilizing the criteria identified in Section II of this procedural model.

## 2.0 Examination

This section of the procedural model may be characterized as the "armchair analysis" of the objective, since this evaluation is done at the teacher's desk using examination criteria and decision aids to determine the quality of the objective. Deficiencies identified in the objective may be remediated at this point through the use of the decision aids provided in the Teacher's Handbook. The products of this section of the model are an objective judged to be of acceptable quality, a written instructional plan to teach the objective, and a written evaluation plan to determine student status and progress.

### 2.1 Apply Checklists and Decision Aids

The teacher is instructed to apply the checklists and decision aids associated with the following examination criteria:

#### 2.11 Behavior

This criterion is treated in two parts: (1) behavioral statement and (2) level of behavior. The most universally accepted characteristic of a properly specified performance objective is that it is stated in terms of observable, measurable *student* behavior (Craik, 1971; Davis *et al.*, 1972; Farquhar, 1973; Kapfer and Ovard, 1971; Lee and Merrill, 1972; Lindvall, 1964; Mager, 1962; Popham and Baker, 1970; Tyler, 1964). This criterion stresses the use of action verbs in the objective statement, verbs that depict what the student will be *doing* as a result of having achieved this objective (Mager, 1962). This clearly specifies the kind of behavior that will be accepted as

evidence that the learner has achieved the objective. Decision Aid I in the Teacher's Handbook (Appendix C) is provided to assist the teacher in determining if the objective is stated properly.

**A statement of student behavior is a necessary, but not a singularly sufficient, quality of a properly stated performance objective. The teacher also should be certain that the behavior stated is at the desired level of learning (Baker and Popham, 1973;** Burns, 1972; Davis *et al.*, 1972; Gagné, 1964, 1965; Harmon, 1969; Kapfer, 1971; Lindvall, 1964; Sullivan, 1969). The criticism that performance objectives foster only low-level learning is proof that this criterion is often overlooked. There is a danger that writers will emphasize the lower-level learnings, since performance objectives for the higher-order learnings are more difficult to write. This criterion is intended to prevent concentration on only low-level learnings by urging the teacher to be sure that the behavior stated in the objective is that which he/she intends to foster. Krathwohl (1965) discusses the efforts of Bloom *et al.* (1956) and Krathwohl *et al.* (1964), who have developed classification schemes of behavior which can be used to aid in making this decision. These works treat the cognitive and affective domains, respectively.

Work toward a taxonomy of objectives in the psychomotor domain, although not as thoroughly developed as in the sources cited above, has received attention by several authors (Harmon, 1969; Harrow, 1972; Jewett, 1971; Simpson, 1971). Information which may aid the teacher in determining if the behavior is stated at the appropriate level is included in Decision Aid I of the Teacher's

Handbook (Appendix C). The important point is that performance objectives need not be directed only toward low-level learnings. The teacher must be certain that the behavior stated in the performance objective is that which is desired of the students.

## 2.12 Conditions

This criterion is characterized by the question, "Are the conditions under which the behavior is to be demonstrated, specified and appropriate?" Numerous authors have cited this "givens" portion of the statement as being essential to the proper specification of a performance objective (Burns, 1972; Davis *et al.*, 1972; Farquhar, 1973; Kapfer and Ovard, 1971; Lee and Merrill, 1972; Lindvall, 1964; Mager, 1962; Paulson and Nelson, 1969).

The information typically included in the conditions portion of the objective is instructions to be given, equipment to be used, assumed entry skill level, and description of surrounding environment. It should be noted that this statement is intended to describe the conditions under which the behavior is to be demonstrated upon assessment, not the conditions under which the learning takes place (Farquhar, 1973; Paulson and Nelson, 1969).

The conditions component of the objective is important in effectively communicating educational intent. By qualifying the conditions under which the intended behavior is to be demonstrated, one further defines the behavior and minimizes the changes for misinterpretation. Regarding the detail in which these conditions should be described, Mager suggests:

> You should be detailed enough to be sure that the target behavior would be recognized by another competent person, and detailed enough so that other possible behaviors would not be mistaken for the desired behavior. You should be detailed enough, in other words, so that **others understand your intent as YOU understand it.**
>
> **(Mager, 1962, p. 26)**

**A description of the conditions is essential as a teacher begins to outline instructional plans and evaluation procedures (Paulson and Nelson, 1969).**

## 2.13 Standards

The third important criterion by which performance objectives may be evaluated is the standard for performance specified in the objective. This criterion can be characterized by the questions, "Can one readily identify the standard to which student behavior must conform?" and "Are the standards specified in this objective satisfactory as criteria by which student behavior will be judged?" The teacher, using the Teacher's Handbook, is asked to analyze the objective under consideration with these questions in mind. Many authors support the fact that a portion of an acceptable objective must specify "how well" a learner is to demonstrate the behavior in question (Burns, 1972; Davis *et al.*, 1972; Farquhar, 1973; Kapfer and Ovard, 1971; Lee and Merrill, 1972; Lindvall, 1964; Mager, 1962; Sullivan, 1969). However, guidelines for the specification of these standards often are not defined.

Several authors provide differing guidelines for generating the standards portion of the objective (Davis *et al.*, 1972; Farquhar, 1973; Mager, 1962; Popham and Baker, 1970). There is agreement, however, that factors such as the characteristics of the students,

the importance of the objective, and the opportunity for review must be considered in establishing acceptable criteria. "Blanket" statements of acceptable performance across a wide variety of performance objectives and students, i.e., the commonly accepted 80% mastery level, are not advisable (Sullivan, 1973).

In addition, the agreement between the standards specified and the level of behavior desired should be considered (Craik, 1971; Kapfer, 1971; Paulson and Nelson, 1969). This means that the standards should correspond not only to the degree of performance expected, but also to the level (taxonomically speaking) of learning expressed by the objective.

## 2.14 Semantic Quality

The precision and clarity with which an objective is stated is of considerable importance (Ammons, 1964; Burns, 1972; Craik, 1971; Dell, 1972; Lindvall, 1964; Maguire, 1968; Popham, 1969). The performance objective should be stated with as little ambiguity as possible, since the properly written objective can be a powerful means of communicating instructional intents to various audiences. Sources of confusion may be as varied as terms used, grammatical construction and level of language used. As the objective is inspected for semantic quality, the teacher is urged to consider this communication aspect by keeping in mind those who are likely to read it.

One concern regarding communication of instructional intent via the performance objective is related to the learners themselves. Although the evidence is inconclusive as to the learning benefits that accrue, performance objectives may be given to the learner to

read and consider prior to and during a learning experience (Duchastel and Merrill, 1973). **If objectives are to be given to the students, one must consider whether or not they are stated in language which is understandable by the learner (Burns, 1972; Dell, 1972; Mager, 1968).**

## 2.15 Specificity

The issue of the specificity with which the objective should be stated is, perhaps, the most difficult area to investigate. This is true for two reasons: (1) there is considerable debate concerning the desirability of specifying objectives on the "day-to-day" level (requires the generation of a good number of content-specific objectives), and (2) authors who write on the topic of objectives frequently are unclear as to the level of objective (with regard to specificity) about which they are writing. For example, some writers, when examined closely, are referring to the stating of goals,[1] but use the term objectives. Nevertheless, the criterion of level of specificity was judged as being important for the teacher to consider in examining an objective.

The question posed to the teacher as a part of the model is, "Is the objective stated at a level of specificity which enables the user to plan instruction and evaluate student progress (Dell, 1972; Krathwohl, 1965; Moxley, 1972; Paulson and Nelson, 1969; Popham and Baker, 1970; Tyler, 1964)? This question was included in the model

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[1] A broad, general statement of instructional intent which need not conform to the criteria of a performance objective (Burns, 1972).

because of the general support found for these two uses for an objective at the level of instructional planning (teacher level).

Several authors have attempted to address the question, "How specific should my objectives be?" The overriding consideration is the way in which the objectives are to be used (Krathwohl, 1965). General guidelines are provided by Tyler (1964), who states, "The objective should be stated at the level of generality of behavior that you are seeking to help the student acquire" (p. 79). Moxley (1972) adds,

> Objectives are necessarily specific behavior to the extent that you desire agreement, to the extent that people are indeed talking about the same things or to the extent that your outcome agrees with your prediction. (p. 30)

Krathwohl (1965), who suggests three levels of objectives, in referring to the third level (creation of instructional plans), states:

> ...this kind of detailed analysis brings into focus the objectives of specific lesson plans, and the level of achievement required for each goal or objective if successful accomplishment of the next goal in this sequence is to be achieved. (p. 84)

Based upon the rationale provided above, the decision was made that the levels of objectives most appropriate for use by the teacher in planning instruction and evaluation are terminal objectives and enabling objectives.[1] Terminal objectives (T.O.) express learner behavior in meaningful units, i.e., run, jump, throw, kick, etc., and, as such, become the means for organizing instruction. These T.O.'s conform to the criteria for a properly stated performance

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[1]See Chapter I, p. 6, for a definition of these terms as they are used in this study.

objective and would very likely be the level of objective cited in response to the question, "What do I want the learners to be able to do as a result of my instruction in this unit on _____?" Enabling objectives (E.O.) form the bridge between the learner entry level and the T.O. and very likely would be the level of objective cited in response to the question, "What does the learner have to be able to do in order to achieve the T.O.?" As such, these E.O.'s become "...primarily a device or framework to facilitate instruction or instructional design" (Paulson and Nelson, 1969, p. I-16). Figure 6 is an attempt to depict, in simplified form, the relationship of T.O.'s and E.O.'s in a hierarchy of objective statments.

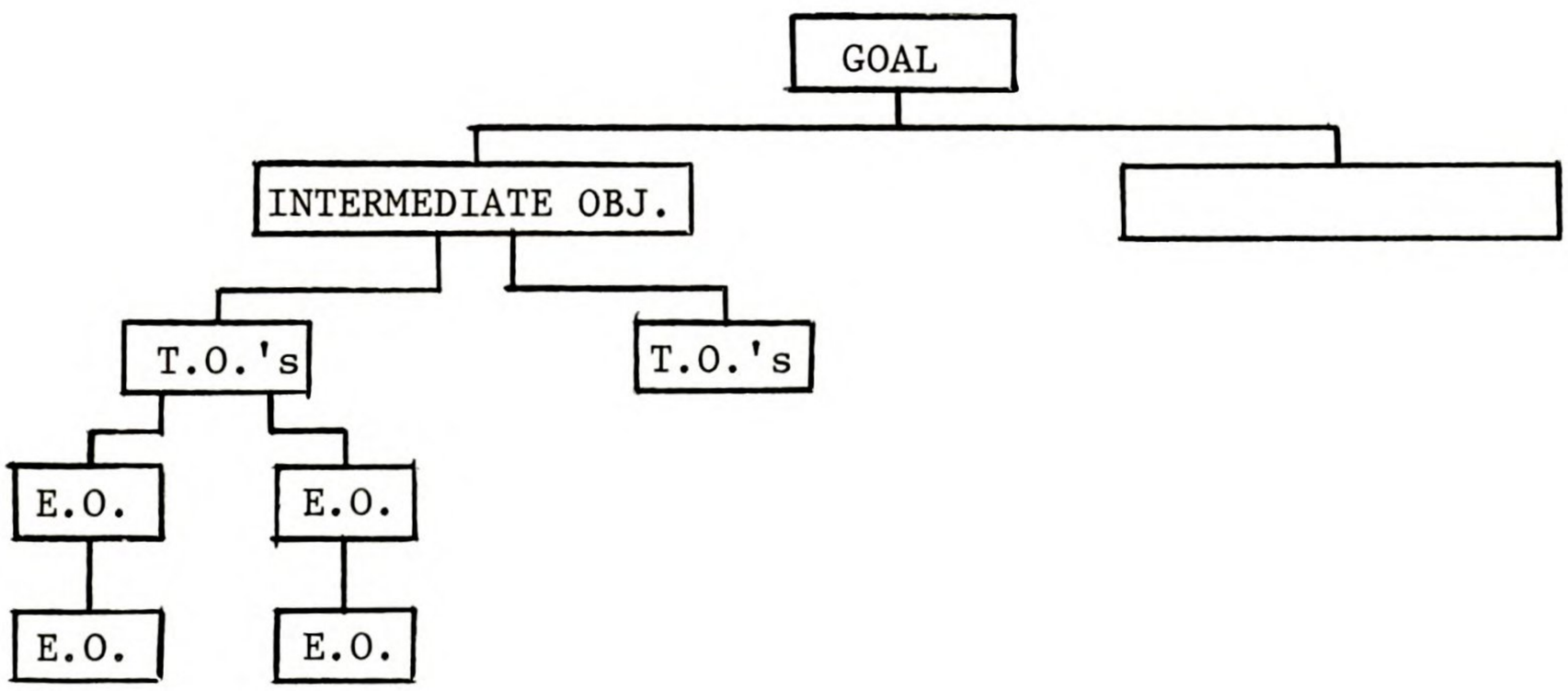


Figure 6 A Hierarchical Structure of Objectives.

Decision Aid IV in the Teacher's Handbook is designed to provide the teacher with help in considering the level of specificity of an objective. Quite often, teachers who are writing objectives become discouraged due to the tendency to generate objectives at the E.O.

level without having the T.O. to guide their thinking (Paulson and Nelson, 1969). Other teachers who are selecting objectives from available sources often are disappointed due to the lack of specificity of the objectives typically encountered (often they are more general than those at the T.O. level). Decision Aid IV provides the teacher with a strategy to remedy either of these two common problems.

A sub-point within this criterion area is the sequence of the E.O.'s leading toward the achievement of a T.O. The teacher is encouraged to examine the E.O.'s under consideration and sequence them according to the most logical order for instructional purposes.

2.2. Decision Point

The teacher makes a satisfactory-not satisfactory decision regarding the degree to which an objective meets the criteria cited above.

2.3 Revise Using Decision Aids

Objectives judged unsatisfactory in some respect are revised using the suggestions supplied in the decision aids. Then the objective, in its revised form, is examined further using the next step in this section of the model.

2.4 Written Specifications

The examination of the objective, to this point, has been strictly a mental process using the criteria provided. In this section of the model, the teacher is asked to use the performance objective as a guide in formulating a written evaluation and instructional plan.

## 2.41 Evaluation Plan

As mentioned previously, one of the important functions of a properly stated performance objective is that it helps the teacher formulate a plan to evaluate student status (Ammons, 1964; Baker and Popham, 1973; Burns, 1972; Craik, 1971; Davis *et al.*, 1972; Duchastel and Merrill, 1973; Lindvall, 1964; Mager, 1968; Michael and Metfessel, 1967; Paulson and Nelson, 1969; Rahmlow, 1971; Tyler, 1964). As an additional check on the essential components of the objective, the teacher is asked to write how he/she will: (1) assess the entry level behavior of learners and (2) assess the post-instructional behavior of learners. Decision Aid V provides the specifications for the content of the evaluation plan. Deficiencies in the prototype objective are quickly discovered by application of this written test; and additionally, the teacher now has a written evaluation plan for the objective.

## 2.42 Instructional Plan

A frequently cited advantage of specifying performance objectives is the aid which they provide to the teacher in instructional planning (Ammerman and Melching, 1966; Baker and Popham, 1973; Burns, 1972; Davis *et al.*, 1972; Duchastel and Merrill, 1973; Esbensen, 1971; Krathwohl, 1965; Lindvall, 1964; Mager, 1968; Michael and Metfessel, 1967; Paulson and Nelson, 1969; Petro, 1969; Rahmlow, 1971; Tyler, 1964). This does not mean that performance objectives specify how to teach, but rather that they guide the teacher in planning instruction by adding a degree of insurance that the learning activities selected will foster student learning toward valued and

previously selected objectives. The teacher is encouraged to write how he/she will teach toward this objective using an instructional plan format provided in Decision Aid VI. Inability to do this may **reveal: (1) deficiencies in the objective, or (2) deficiencies in the preparedness of the teacher to use this objective. The product of this step in the procedural model is a written instructional plan designed to achieve the given objective.**

2.5 Decision Point

If the objective is found to be deficient as an aid in writing an instructional plan or an evaluation plan, the teacher refers to the examination criteria previously cited (Section 2.1) or seeks help from a colleague or consultant in an attempt to refine the objective to acceptable quality. If the objective does aid in the writing of instructional specifications, the teacher proceeds to the tryout section of this procedural model.

3.0 Tryout

The tryout section is the true test of the components of the objective (Sanders and Cunningham, 1972; Sullivan, 1973; Steele, 1973; Tyler, 1964). In this section, a simple procedure is suggested for the teacher to follow in trying out the prototype objective. The tryout phase is followed by a re-examination of the objective applying many of the same criteria employed in the examination section of the model. A final decision point is reached, and the objective is either modified and recycled through the tryout process again, or it is accepted as a proper or refined performance objective.

## 3.1 Student Tryout

The procedure for a trial of the performance objective is suggested in the Teacher's Handbook. The specifications of this procedure are as follows:

### 3.11 Assess

The teacher is asked to use the previously written evaluation plan to assess the status of the learners on the skill in question. This involves observing, evaluating and recording the level of ability for each student in a usable format (one is suggested in Decision Aid V).

### 3.12 Teach

The teacher is asked to employ the previously written instructional plan in an effort to enhance student performance on this objective. No attempt is made to dictate to the teacher the delivery mode to be used in teaching this objective.

### 3.13 Reassess

After completing the suggested instructional time for teaching this objective, the teacher is asked to reassess the learners, using the evaluation plan. It is suggested that the teacher record this reassessment information on the same or similar sheet as was used for initial assessment in an attempt to depict the learning which resulted from instruction on this objective.

Although the thrust of this study is not teacher-training, a very basic teacher behavior model is suggested as a part of the tryout procedures in an effort to standardize this phase of the study.

The methodology used to estimate the degree to which the teacher implemented this model properly is explained in Chapter IV. Figure 7 depicts the teacher behavior model suggested as one way to systematically implement an objective-based instructional program.

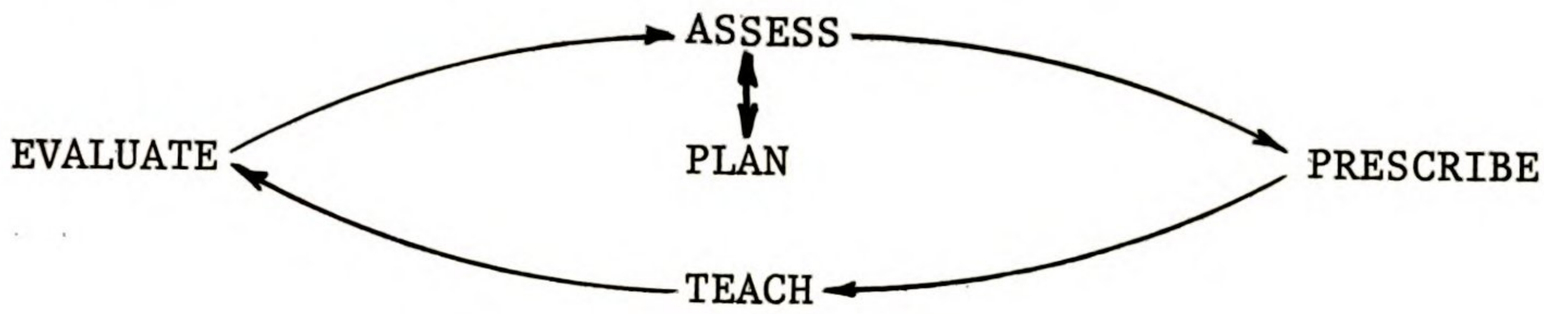


Figure 7. A Teacher Behavior Model.

3.2 Checklist

After following the suggested tryout procedures described above, the teacher is asked to re-examine the objective employing many of the same criteria as in the Examination (2.0) section of the model. The teacher is asked to respond to the question, "As a result of having tried this objective with students, are there changes you would make in the: (a) behavior, (b) conditions, (c) standards, (d) wording, or (e) sequence of the E.O.'s?"[1] The implementation of the objective with a student population is expected to result in modifications being made which may have been overlooked upon simple visual inspection.

3.3 Decision Point

Following the tryout with students and the application of the checklist, the teacher again makes a revise-no revise decision. If

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[1]Again, only a logical analysis is applied here. A more systematic method of determining the appropriateness of a sequence of instruction, as suggested by Gagne (1967) and applied to physical education by Seefeldt *et al.* (1972), is available but was judged as being beyond the scope of the present study.

the objective is judged as being deficient in some respect, it is revised in accordance with that deficiency and put into a "hold" category to be tried again at the next opportunity. However, if the objective is judged as being acceptable, it is designated a "refined" objective and, as such, represents the final product resulting from the application of the procedural model developed in this study. Not only does this "refined" label denote a technically correct objective, but it also indicates that this objective is suitable for the particular school setting, type of students, and teacher in question.

This concludes the presentation of the procedural model for the refinement of performance objectives in physical education which was developed as a part of this study. In Chapter IV, the methods and procedures used in the formative evaluation of the preliminary procedural model are presented in detail.

# CHAPTER IV

# METHODS AND PROCEDURES

## Restatement of the Problem

The purpose of this study was to develop and formatively evaluate a procedural model for the selection and refinement of performance objectives in physical education.

## Overview of Methodology

This chapter is organized according to the steps which were employed in this study. Figure 8 presents the steps of formative evaluation in flowchart form. Briefly, this study proceeded as follows: (1) development of a prototype procedural model for the selection and refinement of performance objectives in physical education and a Teacher's Handbook which operationalizes the model; (2) examination of the prototype model by a panel of "experts" (committee members); (3) Tryout I of the prototype model with a small (N=5) number of teachers; (4) individual and group debriefing techniques to gather data; (5) analysis of the Tryout I data; (6) generation of a revised Teacher's Handbook based upon Tryout I recommendations; (7) Tryout II of the revised Teacher's Handbook with the same group of teachers; (8) analysis of the Tryout II data; (9) determination of the utility of the procedural model.

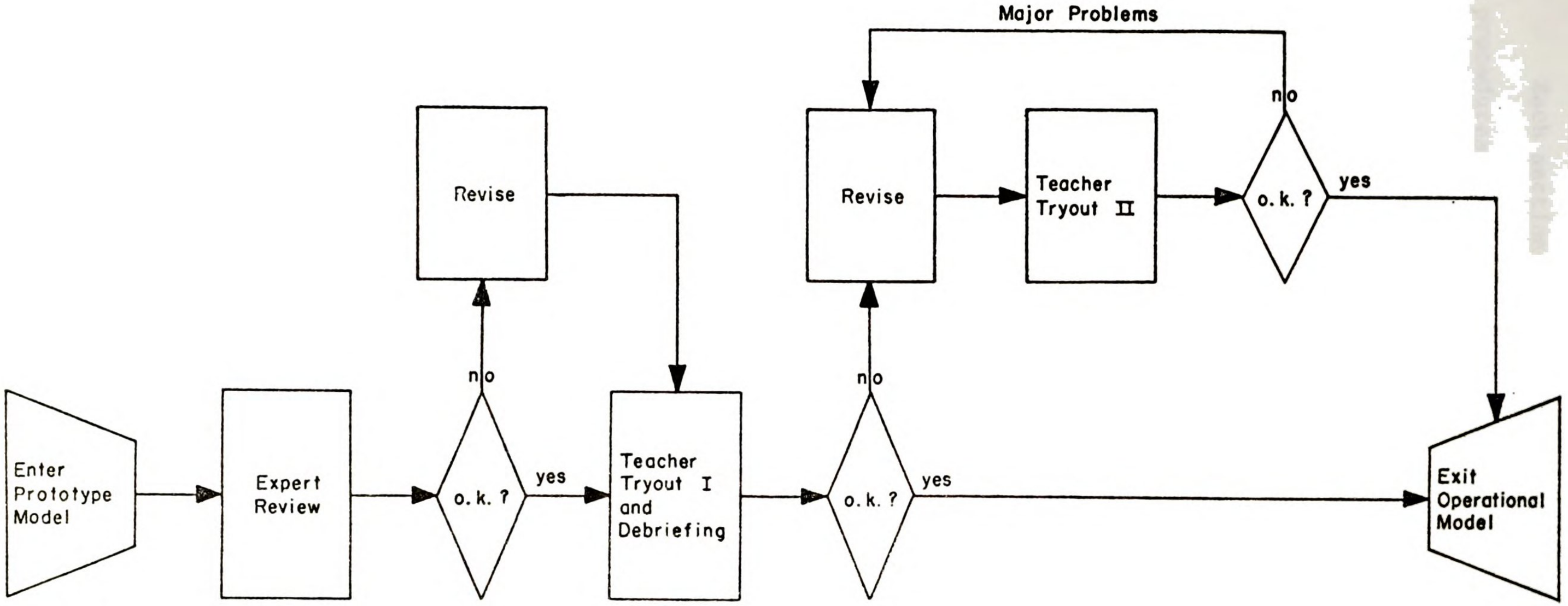


Figure 8 The Formative Evaluation Process Employed in this Study

Each section of this chapter which follows explicates the procedures briefly outlined above.

## Development of the Model

The procedural model, presented and documented in Chapter III, represents a systematic review of the literature regarding the recommended qualities and functions of performance objectives. The intention was to present this information in a "package" which will be useful to persons interested in the selection and/or refinement of performance objectives. The Teacher's Handbook (Appendix C) represents such a "package", as it operationalizes the procedural model which was developed. Since the model is presented in Chapter III, that part of this study will not be explicated in this chapter.

## Critical Appraisal

The procedural model and the formative evaluation plan were presented for critical appraisal to a panel of university professors (four committee members) (Sanders and Cunningham, 1972). This panel performed a logical analysis of the components of the procedural model and the evaluation methodology to be used. Deficiencies identified by this panel were explored by personal discussion. In instances in which the rationale for a suggested revision was judged to be sufficient by the author and two panel members, this revision was to be made prior to the initial trial by teachers.

## Formative Evaluation - Tryout I

At this point in its development, the procedural model represented a review of the literature and the input of university faculty members. The next step in the development process, small group tryout followed by debriefing, has been documented substantially in Chapter II.

Five physical education teachers were selected based primarily upon their willingness to take part in this study (Hamreus, 1969). The characteristics of these teachers are presented in Appendix A. These teachers were asked to implement the Teacher's Handbook using prototype performance objectives which were commensurate with their on-going instructional plans (see Appendix B for examples). More specifically, the procedures employed included: (1) an initial contact and explanation of this study to individual teachers, (2) the securing of a signed participation agreement (Appendix D), (3) the determination from each teacher of two skill areas from which prototype objectives could be selected and assigned, (4) a meeting of the participating teachers to explain procedures, disperse the Teacher's Handbook and prototype performance objectives and establish a timeline for completion and follow-up procedures. Each teacher used one prototype objective to implement the steps of the procedural model, with one physical education class.

## Individual Debriefing

An interview or debriefing session was conducted following the processing of the prototype objective and the completion of the Teacher Reactionnaire (Appendix E). This session was structured

around comments made in the Teacher's Handbook and stated teacher reactions. Any item on the reactionnaire rated "neutral" or negative was noted for further exploration in this session. An agenda for each one-to-one session was followed, with the goal being identification of deficiencies, possible alternatives and supporting rationale. Each teacher participated in one of these audio-taped sessions with the investigator. The result of the individual debriefing sessions was a list of possible revisions in the procedural model, with supporting rationale, compiled in summary form by the investigator after reviewing the tape of each session.

An additional purpose for the debriefing session was to gather information regarding the tryout section of the procedural model (explained in detail in Chapter III). The question to be answered was, "To what degree did this teacher follow the tryout procedures recommended in the Teacher's Handbook?" Data to answer this question are gathered best using an observation (monitoring) technique; however, the constraints within which this study was conducted dictated that the information be gathered in a post hoc fashion. That is, data were solicited in the form of: (1) written evaluation and instructional plans and student scores sheets used in the tryout (Decision Aids V and VI of the Teacher's Handbook) and (2) answers to questions designed to determine if the teacher employed the tryout procedures correctly. The self-reported information (from the teacher) was a sequential description of the way in which assessment, teaching and reassessment were conducted. The written and taped information related to the proper implementation of the tryout phase was reviewed

and rated following completion of the debriefing session. The rating was done by the investigator using a Tryout Rating Checklist containing the items of interest (see Appendix F). Items on this rating form were assigned weights on the basis of importance in the tryout procedure. A teacher was judged as having implemented the tryout procedures to an acceptable degree upon receipt of 70% of the possible rating points. This implementation rating was used to partially answer the first research question of interest in this study.

## Group Debriefing

In an attempt to insure that revisions in the Teacher's Handbook represented a teacher consensus, a group meeting was held to consolidate their reactions. Possible revisions were presented, discussion was invited and the feelings of the group toward the revision suggestions were solicited. The basis for "revise-no revise" decisions was the consensus of teachers on each possible revision discussed in this meeting. Agreement of three of the tryout teachers was required in order for a suggested revision to be implemented.

## Generate Revised Model

Suggested changes in format, wording, and criteria employed which were supported by acceptable rationale and group consensus were incorporated into the second draft of the Teacher's Handbook. The decision criteria cited above were adhered to; however, suggestions of merit (based on rationale) which were not supported sufficiently to be incorporated were compiled and held for future reference. The

model was in revised form and ready for a second trial at this point.

## Formative Evaluation - Tryout II

The same teachers involved in Tryout I were asked to process an additional prototype objective using the revised procedural model. The procedures were the same as in Tryout I, except that teachers were asked to write deficiencies, alternatives, and rationale in lieu of a debriefing session. It was anticipated that all major deficiencies (those involving substantial additions or deletions) had been identified in Tryout I. Minor deficiencies (word choice, punctuation, etc.) identified in Tryout II were treated by the author based upon strength of rationale. In the event that major deficiencies were cited, another group debriefing session was to be held. Each teacher completed a Teacher Reactionnaire and processed one performance objective using the revised procedural model during Tryout II.

## Analyze Tryout II Data

The teacher reactions from Tryout II were analyzed to determine whether or not an additional revision and tryout were necessary.

## Utility of the Model

The utility of the revised procedural model was determined by investigating two research questions designed to yield information regarding the feasibility and effectiveness of the procedural model and Teacher's Handbook developed in this study.

Question 1: **Can teachers use the procedural model to select and refine performance objectives in physical education (feasibility)?**

Data Source:

Field Test Teachers

Instruments:

(1) Teacher Reactionnaire (Appendix E)

(2) Tryout Rating Checklist (Appendix F)

Data:

(1) A processed performance objective based upon use of the revised Teacher's Handbook.

(2) Attitude data from statements on the Teacher Reactionnaire.

(3) Implementation rating from the Tryout Rating Checklist.

Treatment:

(1) The median of the ratings on the Teacher Reactionnaire was determined.

(2) An implementation rating was determined by computing the total possible points achieved on the Tryout Rating Checklist.

Decision Criteria:

The revised procedural model ($M_R$) was considered to be feasible based upon the following criteria:

(1) Complete processing of one prototype objective by four of the five field test teachers;

(2) A median value $\leq 2$ from the field test teachers to the attitude statements on the Teacher Reactionnaire;

(3) A median implementation rating $\geq$ 15 (70% of total possible points) across all teachers.

As mentioned above, one of the expected results from Tryout II was five performance objectives which had been subjected to the revised procedural model. These objectives were utilized to investigate the second research question of interest in this study.

Question 2: Can physical education teachers effectively select and refine performance objectives using the procedural model developed as a part of this study (effectiveness)?

Data Source:

A selected panel of eleven full-time physical education teachers (described in Appendix G).

Instrument:

A Likert-type rating instrument, designed for content validity and reflective of the criteria in the procedural model was used (see Appendix H for a sample of this instrument). Each teacher employed this instrument to rate a list of ten performance objectives (five prototype objectives and five objectives processed by the procedural model).

Data:

Scalar data reflecting the teacher's judgment of the degree to which each objective fulfilled the specified criteria. Reactions were summarized in the form of: $\underset{5}{___}\ \underset{4}{___}\ \underset{3}{___}\ \underset{2}{___}\ \underset{1}{___}$ where 5 = satisfies all criteria, 4 = satisfies all but one criteria, 3 = satisfies three or four criteria, 2 = satisfies one or two criteria,

and 1 = satisfies no criteria. These data are considered to be measured on an ordinal scale.

Treatment:

Data were compiled by objective to yield a median value for each objective. The objectives were ranked (low to high according to median value) and their type (prototype or refined) was noted. These data were analyzed using the Mann-Whitney U test (Siegel, 1956).

Decision Criterion:

The revised procedural model ($PM_R$) developed in this study was considered to be effective based upon the following criterion: a tabled p value of $\leq .02$ based upon a computed U value which reflects a more favorable ranking of the $PM_R$ processed objectives. A meaningful level of effectiveness was defined such that at least three of the refined objectives would have to rank higher than all five prototype objectives. To determine an appropriate probability level, it was necessary to compute a U value for the ranking situation described above. The calculated U value was used to identify the corresponding p value in the table.[1] In this case, the tabled p value was p=.016; therefore, it was decided that a $p \leq .02$ would constitute the criterion value upon which the effectiveness of the procedural model would be decided.

The above steps outline the procedures employed in this study. The results are presented and discussed in Chapter V, which

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[1]Table J. Table of probabilities associated with values as small as observed values of U in the Mann-Whitney Test. In Siegel, 1956, p. 271.

contains: (1) the recommended revisions in the Teacher's Handbook, and (2) the analysis and results of the data used to answer the research questions of interest in this study.

# CHAPTER V

# RESULTS AND DISCUSSION

The purpose of this study was to develop and formatively evaluate a procedural model to be used by teachers for the selection and refinement of performance objectives in physical education. In this chapter, the results of the formative evaluation of the procedural model, and the Teacher's Handbook which operationalizes that model, are reported and discussed.

## Critical Appraisal

The logical analysis of the procedural model conducted by the panel of university professors resulted in no substantial changes in the model, or the methodology by which it would be evaluated. Therefore, the panel gave their approval of the basic model and the evaluation procedures. No attempt was made by this panel to correct errors in wording and format which the field-testing process was designed to solve.

## Individual and Group Debriefing

No revisions were suggested in the basic configuration of the procedural model which was presented in Chapter III. Therefore, the model is presented as a result of the development and evaluation process employed in this study. The revisions in the Teacher's

Handbook were grouped into categories of organization and content and are presented below.

The following suggested revisions were identified by at least one field test teacher, and subsequently approved by at least two others. As such, these items represent revision hypotheses which were incorporated into the second draft of the Teacher's Handbook (Appendix C).

## Organization

1. Place the Decision Aids after (or in) Section II - Examination rather than after Section III - Tryout.

2. Number the pages consecutively throughout the Handbook (do not number the Decision Aids separately).

3. In making reference to another section of the Handbook, identify that section and the appropriate page number.

4. When the teacher is directed to write on the worksheet, give the page number of the worksheet for easy reference.

5. Eliminate one of the Consolidation Points in the Examination section. Too many of these points are redundant and confusing.

6. Combine points 1 and 2, 3 and 4, and 5 and 6 in Section II - Examination. These six points should be combined into three points to eliminate redundancy and confusion.

7. Move the words "Decision Point" even with the body of the text and underline them. In the first draft, these words were extended to the left of the margin in an attempt to draw attention to them.

8. Be consistent with the use of Roman numerals in referring to the Decision Aids in the body of the Handbook.

9. Color code (print on different colored paper) the various sections of the Handbook, i.e., text, worksheet, decision aids, reactionnaire.

10. Attach index tabs to each Decision Aid (I-VI) for easy access in using the Handbook.

Content

1. On page 2, add a sentence reinforcing the fact that this Handbook operationalizes the procedural model.

2. Add information to the Handbook explaining the term, "trade-off analysis", or eliminate this term from the Handbook. The term was eliminated, because it was confusing and unfamiliar to all field test teachers.

3. Add another sample performance objective to Decision Aid II.

4. Delete questions 21 and 22 on the Teacher Reactionnaire because they are unnecessary or redundant.

5. Add a parenthesis around "instructional and beyond" (page 7).

6. Restate point four on page 11 to conform to points one through six, such that a "yes" response will direct the reader to the next criterion.

7. On page 13, add the heading, "Section II - Part II". This was inadvertently eliminated on the first draft.

8. On page 10, add a fourth step to the directions - "consolidate suggestions into a revised objective statement."

9. In Decision Aid V (p. 24), the word "component" must be defined better as it is used in this context.

10. In Decision Aid VI, p. 25, add an example to clarify what the "focus" column of the diagram means.

11. Decision Aid IV (p. 22), alter the sample performance objective given on this page (eliminate the mention of an obstacle course, and add an additional example).

12. On page 11, where E.O. and T.O. are first mentioned, add "(see Decision Aid IV, p. 20)".

13. On page 10, change criterion two to read, "...under which the behavior is to be demonstrated upon assessment." This would eliminate an inconsistency between this page and Decision Aid II.

14. On page 13, add to the first Decision Point, "...in the objective which..." following "what changes could you make...".

15. On page 21 add "...listed in Section II - Examination, p. 9" to Decision Aid IV so that the reader can refer to these criteria.

16. Teacher Reactionnaire, item 16 - reword this item to direct it toward, "teachers dealing with performance objectives in their teaching."

17. Teacher Reactionnaire, item 18 - alter this statement to include, "an attitude the same or more favorable toward."

These data represent the detailed information obtained from the tryout and individual debriefing techniques employed in this study. Although the field test teachers approved the procedural model, their suggestions for revision represent significant changes in the Teacher's Handbook which operationalizes that model. The prototype Teacher's Handbook was shortened considerably by incorporating the organizational revisions which eliminated redundancy and unclear passages. These results substantiate the effectiveness of the debriefing process as a data gathering strategy during the formative evaluation of educational products (Abedor, 1971; Meyen, 1973; Sanders and Cunningham, 1972).

## The Revised Model

The incorporation of the suggested changes listed above resulted in a revised version of the Teacher's Handbook. This revised version, which was used in Tryout II of the formative evaluation, is presented

in Appendix C for the convenience of the reader. The revised Teacher's Handbook reflects all of the suggested changes listed above.[1]

## Utility of the Model

The utility of the revised procedural model was determined by investigating two research questions:

### Question 1

1. Can teachers use the procedural model to select and refine performance objectives in physical education (feasibility)?

One of the decision criteria used to answer this question was: that four of the five field test teachers must completely process one prototype objective following the procedures suggested in the revised Teacher's Handbook. All of the field test teachers were able to satisfy this criterion by completing the Tryout II procedures. The refined performance objectives which resulted are included in Appendix H (objectives 1, 2, 6, 8, and 10).

The second decision criterion was: that responses to the statement on the Teacher Reactionnaire should yield a median $\leq 2.0$ (across all statements). Responses were marked on a scale from 1 to 5, where: 1 = strongly agree, 2 = agree, 3 = uncertain, 4 = disagree, and 5 = strongly disagree. Since statements on the Teacher Reactionnaire were worded positively and negatively, responses were adjusted during scoring so that all responses reflecting a positive attitude toward some aspect of the Teacher's Handbook were assigned a 1 or 2

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[1]The index tabs were eliminated for the purposes of this dissertation.

rating. Table 1 presents the teacher attitude data in summary form. The median for all teacher ratings of all the statements was 1.45, which indicates a favorable attitude toward the Teacher's Handbook (and thus for the procedural model for the selection and refinement of performance objectives in physical education).

Inspection of the median values for each statement reveals that all but three statements were rated highly favorable (median $\leq$ 2.0). Statement 8, which solicited a reaction toward the cartoons accompanying each section of the Teacher's Handbook, received the most negative ratings of all questions. Follow-up debriefing revealed that the 2.88 median rating resulted largely from a lack of opinion strongly for or against the cartoons. However, no field test teachers suggested that they be removed. The 2.67 median rating for statement 15 reflects the teacher's uncertainty as to whether or not the Teacher's Handbook could be shortened without losing effectiveness. Naturally, the goal was to maintain effectiveness while reducing the amount of time involved in using the Handbook. This rating was interpreted as a desire to work toward that goal.

The 2.25 median rating of statement 16 reflects some uncertainty on the part of two of the field test teachers as to whether or not physical educators would use the Teacher's Handbook. Follow-up debriefing revealed that this response was based upon doubts about the interest of physical educators in using performance objectives, and not negative feelings toward the Handbook. These field test teachers did feel that if physical educators were required to use performance objectives, the Teacher's Handbook would be a valuable aid.

Table 1. Teacher Attitude Data

| Teacher | Statement 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1* | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 |
| B | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 |
| C | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 2 | 1 | 1 |
| D | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | 1 | 2 | 3 | 3 | 2 | 3 | 3 |
| E | 2 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 1 | 5** | 1 | 2 | 1 | 3 | 2 | 2 | 1 | 1 |
| Median | 1.33 | 1.67 | 1.13 | 1.75 | 1.33 | 1.67 | 1.33 | 2.88 | 1.33 | 1.13 | 1.33 | 1.13 | 1.13 | 1.67 | 2.67 | 2.25 | 2.00 | 1.13 | 1.13 |

Overall median 1.45

*A very positive response.

**A very negative response.

The third criterion used to determine the feasibility of the revised procedural model was **that the median implementation rating across teachers must be ≥ 15 (70% of the maximum implementation score on the Tryout Rating Checklist [Appendix F]). The teacher implementation rating data are presented in Table 2. The median** implementation rating, across teachers, was found to be 20.67. This indicates the degree to which the suggested implementation procedures were followed by the field test teachers. These data were interpreted as support for the feasibility of the revised procedural model. It also indicates the willingness of the field test teachers to follow the suggested procedures.

Table 2. Teacher Implementation Rating Data

| Teacher | Points/Possible |
|---|---|
| A | 21/21 |
| B | 21/21 |
| C | 12/21 |
| D | 21/21 |
| E | 20/21 |
| Median | 20.67 |

One teacher, teacher C, received an implementation rating of 12. This rating reflects an unwillingness or inability on the part of this teacher to satisfy the criteria for written information requested

in Tryout II. Debriefing following Tryout I, other written information received and debriefing following Tryout II revealed that this teacher did follow the suggested tryout procedures. This occurrence points out the potential difficulty in asking teachers (even willing subjects) to supply an investigator with substantial written feedback, and is interpreted as support for the individual debriefing technique employed in this study. However, since the other four teachers provided valuable written information, it was judged that this criterion was of sufficient importance to be retained.

Examination of the data to determine the feasibility of the revised procedural model reveals that, in each instance, the data satisfied the criteria established prior to the conduct of this study. The field test teachers: 1) each processed one performance objective using the revised Teacher's Handbook; 2) indicated a positive attitude toward the feasibility of the Teacher's Handbook; and 3) were successful in implementing the suggested tryout procedures to an acceptable degree. These factors established the feasibility of the procedural model developed in this study.

Question 2

2. Can teachers effectively select and refine performance objectives in physical education using the procedural model developed as a part of this study (effectiveness)?

The decision criterion used to answer this question was that a panel of physical education teachers (N=11) would judge the performance objectives processed by the field test teachers to be superior in quality to prototype performance objectives selected for use in this

study (see Appendix H for the list of objectives and criteria used to judge them). The objective rating data obtained as a part of this study are presented in Table 3. Each objective is listed with the rating it received from each member of the objective rating panel. Median rating scores are presented and the rank (high to low) of that objective is indicated.

Table 3. Objective Rating Data

| Objective | | Raters A | B | C | D | E | F | G | H | I | J | K | Median | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *R | 1 | 2 | 2 | 1 | 5 | 1 | 2 | 3 | 5 | 3 | 2 | 3 | 2.37 | 5 |
| R | 2 | 3 | 4 | 3 | 5 | 4 | 5 | 5 | 5 | 4 | 5 | 4 | 4.38 | 4 |
| xP | 3 | 1# | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 2 | 1 | 2 | 1.75 | 10 |
| P | 4 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 3 | 2 | 3 | 2.00 | 6 |
| P | 5 | 1 | 2 | 1 | 2 | 1 | 3 | 1 | 3 | 2 | 2 | 3 | 1.88 | 7 |
| R | 6 | 5 | 3 | 5 | 5 | 3 | 5 | 4 | 5 | 5 | 2 | 3 | 4.58 | 2.5 |
| P | 7 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 1.86 | 8 |
| R | 8 | 5† | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 3 | 5 | 5 | 4.89 | 1 |
| P | 9 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 1.80 | 9 |
| R | 10 | 5 | 3 | 5 | 4 | 4 | 4 | 3 | 5 | 5 | 5 | 5 | 4.58 | 2.5 |

*R - denotes a refined objective.

xP - denotes a prototype objective.

\# - denotes no criteria satisfied.

† - denotes all criteria satisfied.

The objective rating data arranged by rank and type in the data form necessary to perform the Mann-Whitney U test analysis are presented in Table 4.

Table 4. Objective Rating Data by Rank and Type

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Median | 1.75 | 1.80 | 1.86 | 1.88 | 2.0 | 2.37 | 4.38 | 4.58 | 4.58 | 4.89 |
| Type | $^{x}$P | P | P | P | P | $^{*}$R | R | R | R | R |

$^{x}$P - prototype objective

$^{*}$R - refined objective

U = 0

p = .004 from Table J (Siegel, 1956)

These data were analyzed using the Mann-Whitney U test (Siegel, 1956). Analysis yielded a U value of 0, which was found to have a probability of occurrence by chance of p=.004. This value was compared to the previously established decision criterion which was that a $p \leq .02$ (one-tailed test), based upon a U value reflecting a more favorable ranking of the refined performance objectives, was required for the procedural model to be considered effective. The data established the effectiveness of the procedural model which was developed in this study.

These results should be considered a conservative estimate of the effectiveness of the procedural model (Teacher's Handbook). The criteria which foster refinements in a performance objective, making

that objective more appropriate for a particular setting or student age group, were not reflected in the Objective Rating Instrument. Raters cannot determine whether or not changes made in an objective for these reasons improve its quality without knowing the referent situation; therefore, two performance objectives judged to be of equal quality using the criteria employed to treat this question could be very different with regard to appropriateness. The implication is that the procedural model developed and formatively evaluated in this study may promote more subtle refinements (related to a specific referent situation) in a performance objective than the Objective Rating Instrument detects.

In summary, the results of this study were presented in two forms: (1) the revised Teacher's Handbook, which represents the product of the development and formative evaluation procedures employed in this study; and (2) the results necessary to answer the two research questions of interest in this study. In Chapter VI, this study is summarized, conclusions are presented, and recommendations for future research are offered.

# CHAPTER VI

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## Summary

The purpose of this study was to develop and formatively evaluate a procedural model to be used by teachers for the selection and refinement of performance objectives in physical education. The formative evaluation was designed to answer two questions related to the utility of the procedural model:

1. Can teachers use the procedural model to select and refine performance objectives in physical education (feasibility)?

2. Can teachers effectively select and refine performance objectives in physical education using the procedural model developed as a part of this study (effectiveness)?

The review of related literature yielded specifications for the development of the procedural model in this study. The criteria contained within each section of the procedural model represent a synthesis of the criteria contained in empirical studies and criteria derived from theoretical works dealing with this topical area.

Briefly, this study proceeded as follows: (1) development of a a prototype procedural model for the selection and refinement of performance objectives in physical education and a Teacher's Handbook which operationalizes the model; (2) critical appraisal of the prototype model by a panel of university professors; (3) Tryout I of the

prototype Teacher's Handbook by five physical education teachers; (4) implementation of individual and group debriefing techniques to gather data from which to generate revisions; (5) analysis of the Tryout I data; (6) generation of a revised Teacher's Handbook based upon Tryout I recommendations; (7) Tryout II of the revised Teacher's Handbook by the same group of teachers; (8) analysis of the Tryout II data; (9) determination of the utility of the procedural model.

Formative evaluation resulted in no changes in the basic configuration of the prototype procedural model. However, the individual and group debriefing processes used in formative evaluation resulted in the generation of a number of revision hypotheses related to the organization and content of the Teacher's Handbook. Also, the formative evaluation process established the feasibility and effectiveness of the procedural model. The feasibility of the procedural model for selecting and refining performance objectives in physical education was established as a result of the proper implementation of, and teacher attitude ratings toward, the Teacher's Handbook. The effectiveness of the model for selecting and refining performance objectives in physical education was determined by comparing the ratings of prototype and refined performance objectives. A Mann-Whitney U test yielded results indicating the effectiveness of the model ($U = 0$, $p = .004$).

## Conclusions

Within the limitations of the design of this study, the following conclusions were drawn:

1. The procedural model and Teacher's Handbook, developed as a part of this study, are feasible for selecting and refining performance objectives in physical education.

2. Teachers in physical education can effectively select and refine performance objectives in physical education using the procedural model and Teacher's Handbook.

## Recommendations

The procedural model and Teacher's Handbook should undergo further formative evaluation prior to widespread distribution or evaluation of a summative nature. Further development and formative evaluation should consider the following points:

1. The feasibility and effectiveness of the procedural model and Teacher's Handbook should be investigated using a larger number of physical education teachers from various geographical and socio-economic areas.

2. The feasibility and effectiveness of the procedural model and Teacher's Handbook should be investigated using various teacher types, i.e., classroom teachers, teachers of mentally and/or physically handicapped.

3. The feasibility and effectiveness of the procedural model and Teacher's Handbook should be investigated using performance objectives from other than the skill learning area of the psychomotor domain, i.e., cognitive and affective performance objectives in physical education.

4. The feasibility and effectiveness of the procedural model and Teacher's Handbook should be investigated using somewhat different methodology, i.e., (1) the use of a feedback form in place of individual debriefing for data collection where a larger number of teachers are involved, and (2) the comparison of refined objectives to objectives judged to be of satisfactory quality as an alternative means of determining the effectiveness of the procedural model.

Following further development and formative evaluation of the procedural model and Teacher's Handbook, a period of summative evaluation should take place with the object being the provision of comparative information to potential consumers of this educational product.

# APPENDICES

# APPENDIX A

## FIELD TEST TEACHER DESCRIPTIVE DATA

Table A.1. Field Test Teacher Descriptive Data

| Teacher | Sex | Age | Highest College Degree | Undergraduate Major | Yrs. Teaching Experience | Experience Using Performance Objectives |
|---|---|---|---|---|---|---|
| A | F | 20-30 | B.S. | H.P.E. | 2 1/2 | - some experience<br>- can do comfortably |
| B | F | 30-40 | M.A. | H.P.E. | 9 | - some experience<br>- experienced difficulty |
| C | M | 20-30 | B.S. | H.P.E. | 1 | - some experience<br>- can do comfortably |
| D | F | 20-30 | M.A. | H.P.E. | 5 | - no experience |
| E | M | 30-40 | B.S. | H.P.E. | 4 | - some experience<br>- experienced difficulty |

# APPENDIX B

## SAMPLE PROTOTYPE PERFORMANCE OBJECTIVES

## APPENDIX B

## SAMPLE PROTOTYPE PERFORMANCE OBJECTIVES

To demonstrate proper starting ability.

To be able to pitch a softball with proper form and satisfactory accuracy.

To teach children to throw a rubber ball at a target.

To kick a ball with proper form.

To be able to strike an objective with accuracy.

# APPENDIX C

## HANDBOOK FOR THE SELECTION AND REFINEMENT OF PERFORMANCE OBJECTIVES IN PHYSICAL EDUCATION

# HANDBOOK FOR THE SELECTION AND REFINEMENT OF PERFORMANCE OBJECTIVES IN PHYSICAL EDUCATION

by

Donald Larry Carmichael
Michigan State University

FIELD TEST COPY
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APRIL, 1974

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## Preface

In an attempt to conform to the specifications of the current thrust toward educational accountability, individuals, schools, and school districts are currently in the process of examining prevailing practices in relation to the components suggested in most accountability models. One by-product of this phenomenon has been the interest on the part of these persons in specifying desired student outcomes in the form of behavioral or performance objectives. The task of identifying the objectives and then specifying them in behavioral terms has been, and is being, pursued by various groups from State Departments of Education to individual teachers. At all levels, developers have realized that this is a difficult and time-consuming task! It is currently recognized that individuals are experiencing difficulty in generating satisfactory objectives to the extent that large "banks" of objectives from which teachers may choose are being developed by various agencies or groups.

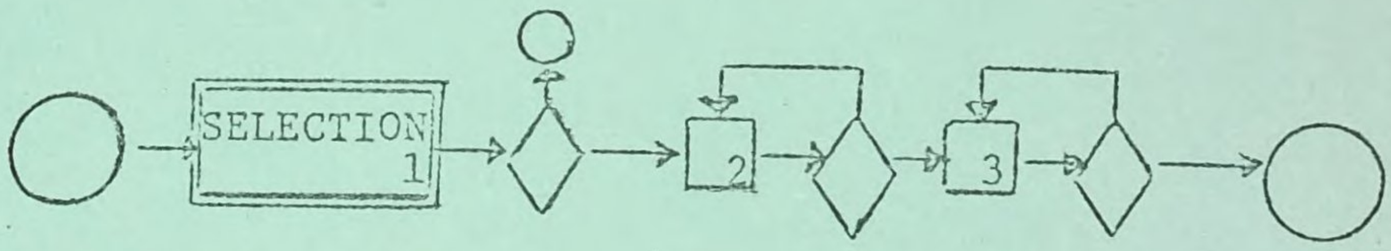
The advent of these "banks" of objectives partially solves the problem for teachers. However, these objectives are not designed with any particular school or teacher in mind, and as such, need to be examined in light of the specific situation in which they are to be used. The necessary direction (criteria) has not been available for teachers to systematically make decisions about prototype objectives.

In an attempt to cope with this perceived need, this procedural model for the selection and refinement of performance objectives in physical

education has been developed (Figure 1). This handbook operationalizes the procedural model and is designed for the teacher who is: (1) in the process of writing performance objectives, or (2) going to select performance objectives from an available source or "bank" of objectives. In either instance, sections of this handbook should be of assistance in determining whether or not a given objectives is appropriate for a particular situation.

## The Procedural Model in Brief

The three stages of the procedural model are presented below as they are depicted in Figure 1. Each stage is briefly discussed and related to the other parts of the model. The intention is for the reader to conceptualize the overall approach being taken in this presentation before considering in detail the criteria specified in each stage.




## Section I - Selection

This section is really more appropriate for the teacher who is selecting objectives from a source. In making such a selection, one could assume that certain criteria are being employed. Criteria are given to assist the teacher in making selection decisions. No relative weightings are suggested, but each teacher should establish criteria for rejecting objectives based upon negative response(s) to the criteria posed. The teacher who is writing performance objectives may also use these criteria, as it is assumed that such concerns are appropriate before acceptance of an objective in any case.

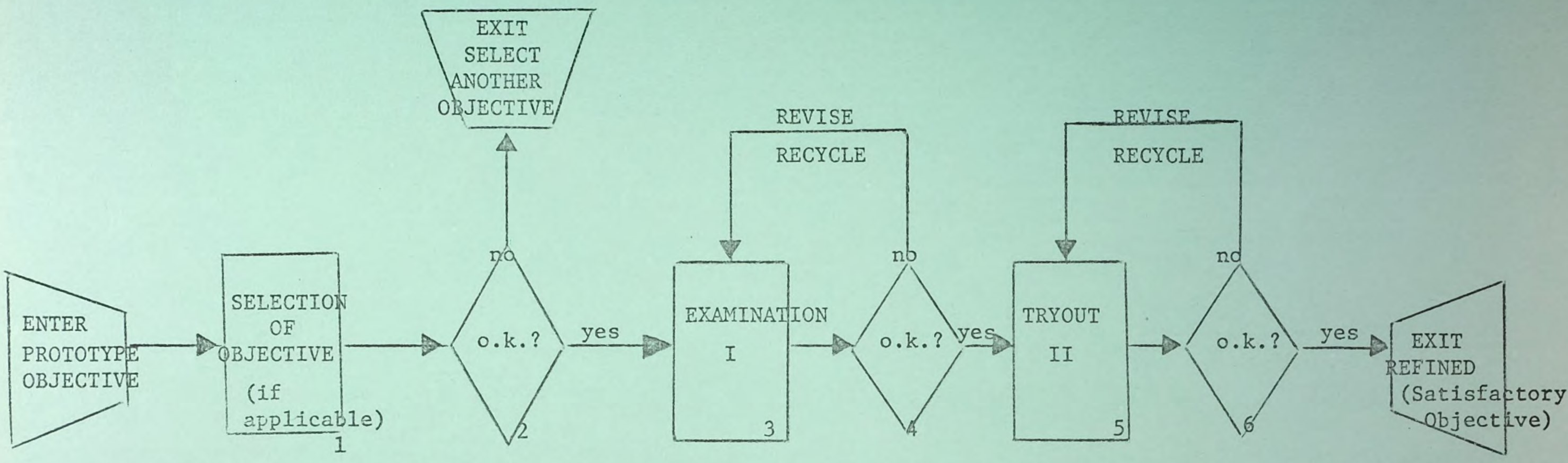
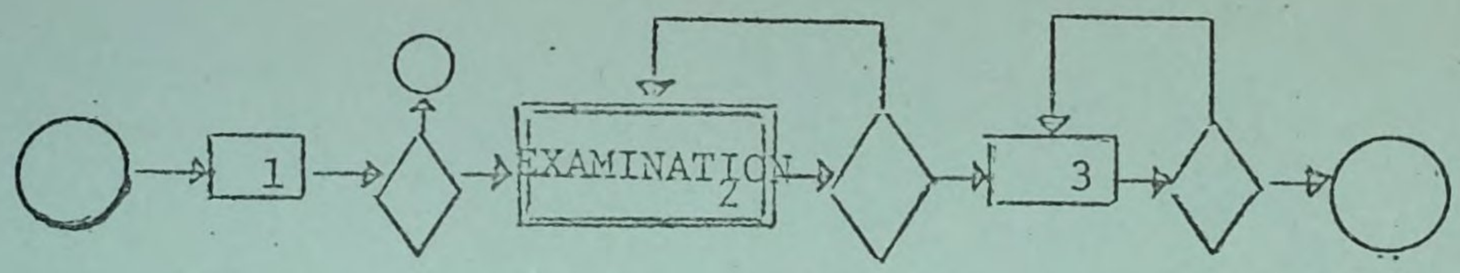



Figure 1 A Procedural Model for the Selection and Refinement of Performance Objectives in Physical Education

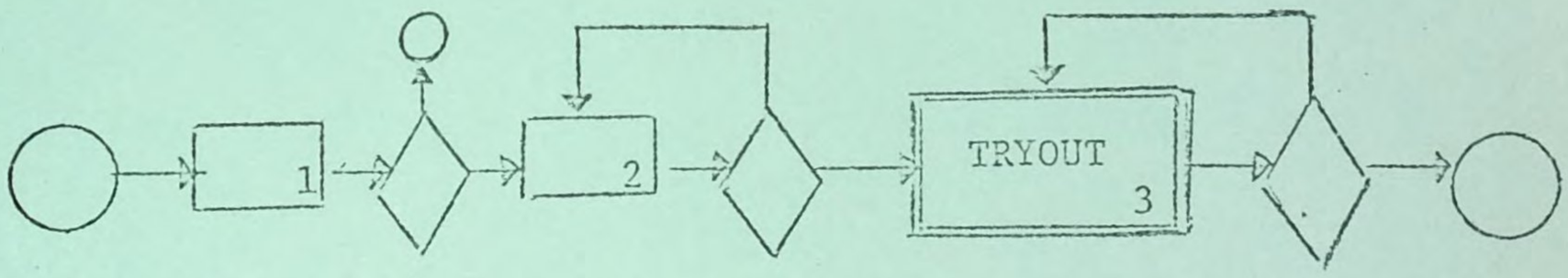



Section II - Examination

Following the selection of an objective(s), the teacher should examine it closely prior to teaching. Section II presents criteria to be used in examining objectives for important components and qualities. This section aids in identifying deficiencies in an objective and provides decision aids to help the teacher derive alternatives which will improve the objective. These criteria are appropriate for examination of any objective, whether teacher generated or selected from an objective bank.

The second part of this section of the model asks the teacher to attempt to write two aids for the implementation of an objective: (1) an instructional plan, and (2) an evaluation plan. Again, decision aids are included to assist the teacher.

The teacher is to compile suggested revision and formulate the revised version of the objective. This objective is to undergo tryout with the students for whom it was selected.




Section III - Tryout

The true test of an objective is how well it works with the students for whom it was written. In Section III, criteria are presented for application to the objective after having taught materials designed to enchance student learning.

The tryout procedure calls for the teacher to employ the previously written instructional and evaluation plans with students. The criteria in Section III will be applied to the objective following this tryout period.

At this point, the responses may be compiled into the refined or revised objective statement. This is the product of the application of the criteria contained in the procedural model; as such, this objective may be said to be of acceptable quality and appropriate for the intended student population.

S E L E C T I O N

The Teacher's Dilemma . . .

Section I -- Selection

The vast amount of information and activities now available for teacher use necessitates making choices in planning units or courses of instruction. It is assumed that all teachers employ criteria in making such choices. This section is presented as suggestions of some important criteria which should be considered in selecting objectives for use in teaching physical education. A teacher having made the selection decision previously may elect to by-pass this section and proceed to Section II - Examination.

The result of considering an objective in light of the following criteria is a reject-accept decision. Various teachers will weigh these criteria differently, but each should establish a standard to which the objective must equate in order for it to be accepted. A low or very low rating on any one of these items may indicate that possibly a more appropriate objective could be selected.

## SELECTION - DIRECTIONS

Step

1. Prepare to work by securing the Worksheet* (back of the Handbook)

2. Write down the prototype objective(s) to be considered either on the Worksheet or a separate sheet.

3. Think about the objective in light of the criteria listed below.

4. Record your rating of the objective in the space beside each criteria on the Worksheet (Blue).

### Selection Criteria

(Record your ratings on the Worksheet to be used with this Handbook)

1. Rate the RELEVANCY of this objective to your school situation.

   What will happen of value to your students now and in the future upon achieving this objective?

2. Rate the SUBJECT MATTER VALUE of this objective.

   Consider: (1) the transfer and academic value of the subject matter; (2) the utility(instructional and beyond)of the objective; (3) your own philosophy of physical education.

3. Rate the FEASIBILITY of this objective for your situation.

   Consider the practicality of teaching toward this objective in light of equipment, facilities, aides, etc.

---

* Note. the Worksheets may be reproduced in the most convenient manner, i.e., xerox or ditto master, in quantities needed to utilize the Handbook. The Handbook itself may be reproduced with the permission of the author only.

4. Rate the degree to which this objective is RELATED TO THE GOALS of your school or district.

   Is this objective in keeping with the stated or implied goals toward which you are committed to work?

5. Rate the MOTIVATIONAL QUALITY of this objective.

   Attempt to predict the reaction of the students when asked to work toward achievement of this objective.

6. Rate the degree to which this objective is appropriate for the AGE LEVEL of your learners.

Step

5. Make accept-reject decision.

6. If your decision was to accept this objective, proceed to Section II. If you rejected this objective, select another prototype objective and apply the criteria in Section I to it.

# E X A M I N A T I O N

Let's Take A Closer Look . . .

## Section II -- Examination

The criteria and decision aids presented in this section are designed to insure that the objective which has been selected contains the properties sufficient for it to be used in teaching students. One should systematically follow the numbered criteria in this section and, again, record responses and suggested revisions on the Worksheet (Blue).

## EXAMINATION - DIRECTIONS

### Part I

Step

1. Secure the examination Worksheet (back of the Handbook - Blue).

2. Think about the objective you have selected in light of the criteria listed below (BE SURE TO USE THE DECISION AIDS - Yellow).

3. Record your rating of the objective in the space beside each criteria on the Worksheet.

4. Consolidate any suggestions into a revised objective statement.

### Examination Criteria

(Record your ratings on the Worksheet, p. 2).

1. Is the student BEHAVIOR specified and satisfactory to you as a demonstration of achievement of this objective, i.e., is the behavior at the APPROPRIATE LEVEL? (Decision Aid I, p. 14, is provided to help you determine a properly stated and appropriate behavior.)

   Decision Point: If you checked "yes", proceed to 2. If "no", decide upon the appropriate observable behavior which you feel the student should exhibit following instruction. Write the behavior in the space on the Worksheet and proceed to 2.

2. Are the CONDITIONS under which the behavior is to be demonstrated upon assessment stated and satisfactory to you? (The "givens" of the objectives may be instructions, equipment to be used, prior learnings, size of equipment, etc.) (See Decision Aide II, p. 16.)

   Decision Point: If you checked "yes", proceed to 3. If "no", you have identified a deficiency. You should determine the conditions under which the behavior to be observed in this objective is to take place. Write the conditions in the space on the Worksheet. Proceed to 3.

3. Can you readily identify the STANDARDS to which student behavior must conform as a part of this objective? (How well the student is to perform the behavior, i.e., degree of accuracy, number of times, quality of movement, etc.) (See Decision Aid III, p. 17.)

Decision Point: If "yes", proceed to 4. If "no", you have identified a deficiency. You must decide upon the standards to which this behavior should conform before the student will be credited with achievement of the objective. Write the standards in the space provided on the Worksheet. Proceed to 4.

4. Is this performance objective stated precisely and understandably? (SEMANTIC QUALITIES) (Terms used, construction, level of language - is it to be read by the learner?, etc.)

Decision Point: If "yes", proceed to 5. If "no", attempt to determine how this objective can be stated better. Write your suggestions in the space provided on the Worksheet. Proceed to 5.

5. Is this objective stated at the level of SPECIFICITY which is appropriate for your use? (Is it too general to aid in planning what you will teach, i.e., do you need to generate some enabling objectives? Is it too specific, i.e., written for only a small segment of a broader skill?) (See Decision Aide IV, p. 20.)

Decision Point: If you checked "yes", proceed to Consolidation Section II - Part I. If "no", you have identified a deficiency. See Decision Aid IV, p. 20 for help in identifying performance objectives that are at the level of specificity appropriate for use by the teacher. Write any changes in the space provided on the Worksheet. Proceed to Consolidation of Section II - Part I.

C O N S O L I D A T I O N

Consolidation -- Section II-Part I

Incorporate all suggested changes written following consideration of criteria 1 - 8 into a revised statement of the objective. Write the revised objective in the space provided on the Worksheet. This revised objective is now the one to be used in Part II of this Section.

## Section II - Part II

You are to use the prototype objective as a guide in writing an evaluation and instructional plan.

Step

1. Attempt to write, in the space provided on the Worksheet (p. 3), the way in which you would determine: (1) the entry level (skill of your students on this objective before teaching it), and (2) post-instruction level (skill of your students on this objective after you have instructed them) of ability of each of your students. (See Decision Aid V, p. 23, for help in doing this.)

### Criteria

Rate this objective on the degree to which it was helpful to you in FORMULATING AN EVALUATION PROCEDURE to determine individual attainment of the desired behavior.

Decision Point: If you rated 1 or 2, proceed to Step 2. If 3, 4, or 5, what changes could you make in the objective which would aid you in planning how to evaluate student performance on this objective. Write any suggested modifications in the space provided on the Worksheet. Proceed to Step 2.

Step

2. Attempt to write, in the space provided on the Worksheet (p. 4), the way in which you would go about teaching the content of this objective. (See Decision Aid VI, p. 25, for help in doing this.)

### Criteria

Rate this objective on the degree to which it was helpful to you in FORMULATING AN INSTRUCTIONAL PLAN for teaching this objective.

Decision Point: If you rated 1 or 2, proceed to Consolidation of Section II - Part II. If you rated it 3, 4, or 5, attempt to determine whether the objective needs further modification, or if you need to see a colleague or consultant for help in planning instruction in this content area. If changes in the objective are suggested, write them in the space on the Worksheet and proceed to Consolidation of Section II - Part II.

Consolidation - Section II - Part II

Incorporate suggested changes written following consideration of criteria 1 and 2 into a revised statement of the objective. Write the revised objective in the space provided on the Worksheet. This revised objective is the one to be used in Section III - Tryout.

# DECISION AIDS

Decision Aid I

BEHAVIOR

## Decision Aid I

### Behavior

A. Can you readily identify the BEHAVIOR which is to be demonstrated by the student following instruction?

The key here is that student performance is specified in measurable, observable, student behavior (not what the teacher will do in teaching). Care should be taken to choose words to describe the behavior that are easily interpreted. For example:[1]

| Words Open To Many Interpretations | Words Open To Fewer Interpretations |
|---|---|
| to know | to write |
| to understand | to recite |
| to really understand | to identify |
| to appreciate | to differentiate |
| to fully appreciate | to solve |
| to grasp the significance of | to construct |
| to enjoy | to list |
| to believe | to compare |
| to have faith in | to contrast |

Some words more appropriate to the psychomotor area are:[2]

#### Physical Behaviors

| | | | | | |
|---|---|---|---|---|---|
| arch | climb | hit | march | ski | swim |
| bat | face | hop | patch | skip | swing |
| bend | float | jump | pull | somersault | throw |
| carry | grab | kick | push | stand | toss |
| catch | grasp | knock | run | step | walk |
| chase | grip | lift | skate | stretch | |

---

1 Mager, R. Preparing Instructional Objectives. Palo Alto, California: Fearon Publishers, 1962, p. 11.

2 Claus, C. K. "Verbs and Imperative Sentences of a Basic Educational Objective." 1968 NCME Paper, Chicago, Illinois.

B. **Is the specified BEHAVIOR satisfactory to you as a demonstration of achievement of this objective? Is the objective at the <u>appropriate</u> level?**

**Appropriate level, as used here, denotes whether or not the behavior you have described reflects what you actually want to teach. For example, do you want the student to exhibit a complex action, but you specify a simple act in the behavior statement?**

An example of levels of behavior in the psychomotor area might be as follows: (from simple to complex level)[3]

1. Make physical identifications (point to things)
2. Perform simple physical tasks
3. Perform complex actions (with instructions or by rote)
4. Perform physically skilled actions
5. Perform an appropriate skilled action in a problem solving situation (determine what is to be done and then do it)
6. Determine acceptable quality in physical products

Different objectives could be described as being aimed toward one of these levels. Be sure the behavior you have stated is at the level of your intention.

---

[3] Harmon, P. "A Classification of Behavioral Objectives in Job Training Programs" in Kapfer, M. (Ed.) <u>Behavioral Objectives in Curriculum Development</u>. Englewood Cliffs, New Jersey: Educational Technology Publications, 1971.

Decision Aid II

CONDITIONS

## Decision Aid II

### Conditions

A. Can you readily identify the CONDITIONS under which the behavior is to be demonstrated?

The conditions or "givens" part of the objective should describe any special equipment or content to be supplied to the learner when you assess if he has learned the objective.

B. Are the stated CONDITIONS satisfactory to you as the "givens" under which the behavior in this objective is to take place?

Examine the objective to be sure you have not:

1) overlooked important information which would cause the objective to be interpreted differently by different readers;

2) been too specific by including information which would be obvious or not needed.

Phrases such as: "Given a verbal cue and a demonstration... ", and "using a 6" ball..." are typical of descriptions of conditions that may be a part of a performance objective.

For example: The conditions in the following performance objective are underlined:

<u>Given a verbal request</u>, and <u>a regulation softball thrown from 30' away in such a manner that the student must move at least three steps into position</u>, the student can catch the ball 3 of 5 times in a two-handed grasping type catch (ball may not touch the body as it is caught).

Decision Aid III

STANDARDS

## Decision Aid III

## Standards

A. Can you readily identify the STANDARDS to which student behavior must conform?

Does part of the objective statement describe how well the student must perform the behavior for you to accept that he has achieved the objective?

B. Are the STANDARDS specified in this objective satisfactory to you as the criterion to which student behavior should conform?

You must determine an acceptable criterion for the amount of successful behavior the student needs to display before you are convinced he has learned the objective. Sometimes the standard is stated as the number of errors permitted to indicate success. Setting such standards tests your ability to juggle three factors:

1. Your enthusiasm or pessimism about what your students are capable of accomplishing.

2. How critical the objective is to learning future objectives.

3. How the objective is nested in other objectives so that if it is not fully learned the first time you will have opportunities to reteach the objective later.

If you use the mastery learning model you should be setting acceptable standards of performance at the 80% proficiency or higher. You are referred to "Deciding Criterion Performance Level for Mastery" (Figure 1 which is reproduced on the following page). You have two decision points in the chart. In diamond one, you must decide if the unit is crucial to understanding units which follow. If the unit is not crucial, then set your standard no lower than 80% success. (You may raise later as your instruction improves) If you decide that the unit is crucial, you move to the second decision point, diamond two. Now you must decide if review is feasible as the student progresses. If the decision is yes, then you may set your standard at the low 90's or mid 80's. If you decide that little or no review is possible (such as in learning water safety before scuba diving) you may set your standard at 95% or higher.[4]

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[4] Farquhar, W. W. Behavioral Objectives: Part A and B. Michigan State University, East Lansing, Michigan, 1973.

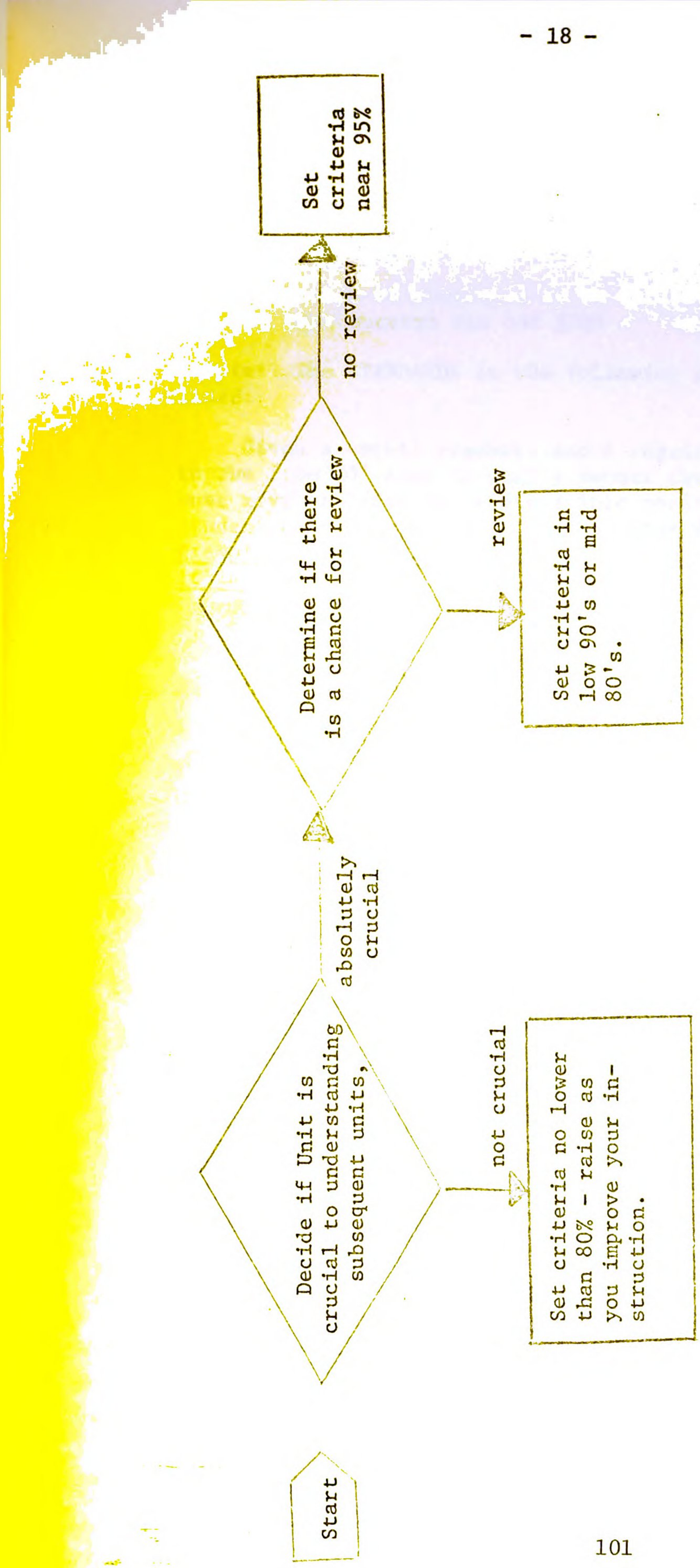



Figure 2 Deciding Criterion Performance Level for Mastery (Farquhar, 1973)

Other factors to be considered in establishing the standards are:

1) The proportion of successes needed on this objective in the "real world" in which the student is to use the learning.

2) The proportion of successes needed for retention.

3) The number of successes to be exhibited by the student to satisfy you that success was not just a "random happening."

For example: The STANDARDS in the following performance objective are underlined:

Given a verbal request, and a regulation softball thrown from 30' away in such a manner that the student must move at least three steps into position, the student can catch the ball 3 of 5 times in a two-handed grasping type catch (ball may not touch the body as it is caught).

Decision Aid IV

SPECIFICITY

## Decision Aid IV

## Specificity

A. **Is this objective stated at the level of specificity which is appropriate for your use?**

**Working Definitions:**

1) Specificity - The degree of detail into which the behavior to be learned is broken.

2) Terminal Performance Objective (TPO) - An activity which stands alone - done in its own right in the intended situation.
example: To perform a functional run.

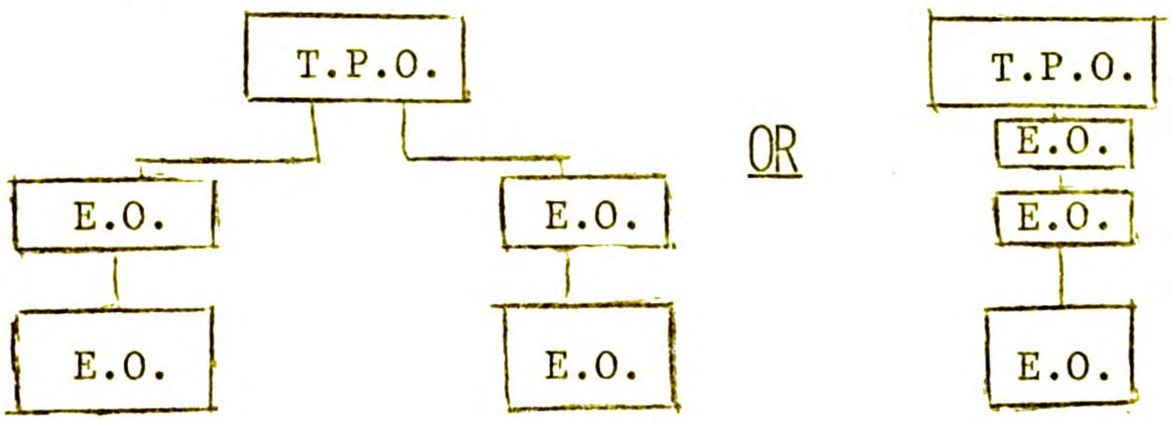
(Note: This example is not presented to demonstrate a properly stated objective, but to convey the level of specificity of a TPO.)

3) Enabling Objective (EO) - The component actions, knowledges and skills the student must learn if he is to attain the terminal objective.

example: Given a verbal request, the student can demonstrate the proper arm action (arm-leg opposition) continuously while running for a distance of 20 yards.

(Note: Again, the important point to note is that this E.O. describes one of the components of a functional running pattern. As such, it is enabling to the T.P.O. concerned with a functional run mentioned above. This might be one of a number of E.O.s listed under this T.P.O.)

The relationship of an E.O. to a T.P.O. is depicted below: (possible examples)




KEY IDEA: Whether or not an objective is at the appropriate level for you is determined by the behavior that you are seeking to help the student acquire.

This implies that you need not necessarily generate E.O.s or T.P.O.s in all instances. You must decide if the objective in question conveys the behavior you want the student to acquire in a way

that best helps you to evaluate the students and plan your instruction.

Therefore IF... the objective in question appears to be too general (more at the TPO level) you may want to generate some E.O.s to help guide student progress toward the T.P.O. A simple way to do this is to ask yourself the question, "What does the learner have to be able to do to accomplish this skill?" Answering this question allows one to identify the component skills necessary to achieve the T.P.O.

REMEMBER ... Each E.O. which you generate should conform to the criteria listed in the Section II - Examination, p. 9.

For Example: The T.P.O. listed earlier - "to perform a functional run" - might have properly stated E.O.s written about such components as:

1) components of a proper running pattern
2) pacing
3) agility

Again, the specificity would be dictated by your students (their skill level) and the behavior that you are seeking to help them acquire.

Sequencing E.O.s

Once broken down, the E.O.s may be ordered for teaching in a manner judged to be most efficient. In some instances we know that certain skills must be acquired before others. It is suggested that a logical sequence be developed based upon known progression, the order which becomes apparent upon "breaking down" the skill into its component parts or simply an intuitive judgment as to a possible learning sequence. This sequence may be revised upon tryout with your students. Revision is to be expected and is encouraged where indicated by student performance.

However, IF ... the objective in question appears to be quite specific (more at the E.O. level) such that it deals with only a fragment of the behavior you wish the student to acquire, you may want to generate the T.P.O. of interest to provide a little more insight into your larger instructional goal. This may also suggest that you generate additional E.O.s as described above.

As you know by now, it is suggested that the performance objective structure judged to be of most help to the teacher is a T.P.O. accompanied by its E.O.s. However, you must make the decision regarding specificity with your students and the behavior which you wish them to acquire in mind.

Using the running example, a T.P.O. with its E.O.s might be:

T.P.O. - The student will demonstrate a functional run.

E.O. 1 The student can demonstrate proper running form while running for 100 feet in one direction as characterized by:
a) consistent non-support
b) foot placement near-on line
c) arm action in opposition to legs

E.O. 2 Given a verbal request, the student can maintain a mature running pattern while pacing a 440 yard run at a moderate to fast speed in a manner such that the first 220 yards and the second 220 yards are within 5 seconds of each other.

E.O. 3 Given a verbal request, the student can sprint 50 yards or more while maintaining a mature running pattern in __ seconds.

Another example of a T.P.O. with accompanying E.O.s is:

T.P.O. - The student will demonstrate a functional volleyball spike.

E.O. 1 The student can spike a ball suspended at standing reach height 4 of 5 times as characterized by:
a) mature vertical jump
b) hit ball above its center
c) land facing the net

E.O. 2 The student can correctly spike a moving ball over a net, positioned at standing reach height 4 of 5 times as characterized by:
a) ball lands within 10' of net
b) student does not touch net
c) student does not cross center line.

Decision Aid V

# WRITING AN EVALUATION PLAN

## Decision Aid V

### Writing an Evaluation Plan

The evaluation plan, simply stated, is the test you will use to determine whether or not students have achieved the objective.

This test should conform to the specifications put forth in the objective statement; that is, the conditions, behavior, and standard of performance specified in the objective should be reflected in the test for that objective. A properly specified performance objective provides the information necessary to formulate the test. (One reason why formulating the evaluation plan helps to identify deficiencies.)

A general check for your test situation is to ask, "Would two or more colleagues agree upon student performance as a result of using the test I have specified?"

Think of the following points in planning your test situation ( a diagram may be helpful to depict how you plan to organize the class, place targets, etc.)

1. equipment needed
2. number of trials permitted each student
3. class organization
4. how you will record the information

The test items used to determine entry level and exit level may be very similar or identical for many skill objectives.

### Recording Student Progress

Various methods may be adopted for recording student progress. A system which enables both the entry level and post-instructional level to be recorded on the same sheet is, perhaps, most efficient.

A sample format is presented below. This type of form should be modified to taste and used to record student progress on the objective in question.

## Class Record Format

| Name | Objective Components | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | I | Comments |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |

Recording Format: X = Entry Skill O = Post-instruction

The recording format means that upon initial assessment, any student achieving that component should be marked X; an open box denotes that the student lacks the component. Upon post-assessment, any students now displaying a component gained would be marked O. Thus, pre and post-evaluation may be recorded on the same sheet.

Master forms such as this may be devised by the teacher and used for many objectives by writing in the components (the key elements the teacher is to look for in evaluating the student) specified in a given objective.

Decision Aid VI

# WRITING AN INSTRUCTIONAL PLAN

Decision Aid VI

Writing an Instructional Plan

A format which is helpful as an organizer is presented as a suggestion of the key elements to be considered in planning your instruction toward an objective:

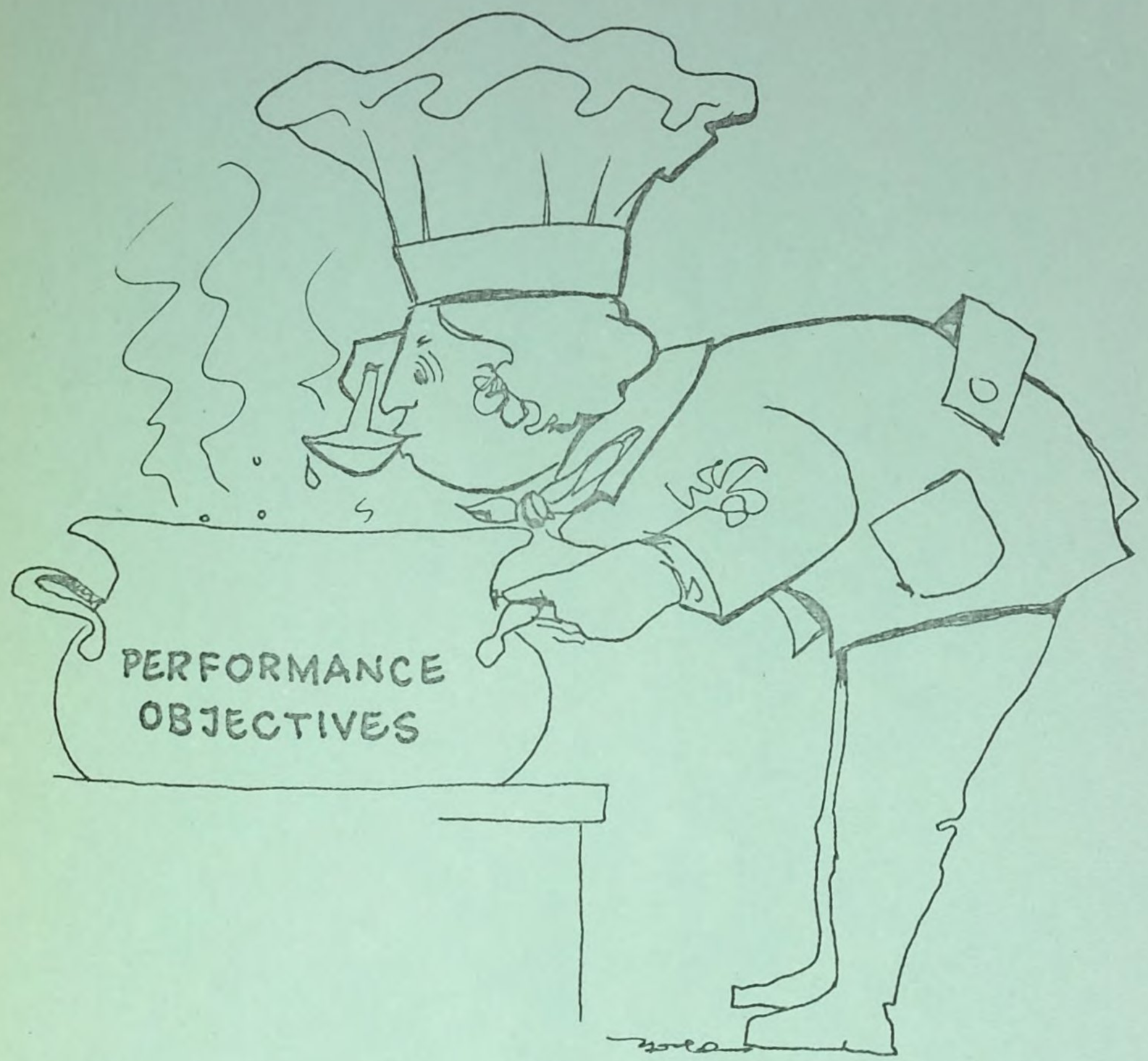
INSTRUCTIONAL PLAN

Grade _____

Date _____

| Focus of this Objective | Class Plans | Formations and Equipment |
|---|---|---|
| (Briefly list the focus here)<br><br>For example:<br><br>Mature run<br><br>a. _ _ _ _ _<br>b. _ _ _ _ _<br>c. _ _ _ _ _<br>d. _ _ _ _ _ | Warm-Up or Intro:<br>(How you will start the class)<br><br>Skills and Practice:<br>(How you will work on focus of objective)<br><br>Summary:<br>(How you will conclude the class) | (List equipment and draw formations you intend to use in instruction) |

T R Y O U T




Section III -- Tryout

Although the criteria provided in Sections I and II will insure that a reasonable objective will be used for the first time, the efficacy of the objective is really not determined until it has been tried with the intended student group. It is possible that unforeseen deficiencies will be identified by actual classroom use. The criteria presented below are to be considered following the tryout period. Responses and suggestions for changes may be recorded on the Worksheet.

## TRYOUT -- DIRECTIONS

Step

1. Use the evaluation plan written in Section II to assess and record the skill level of each student in your class on this objective (1 class period if necessary).

2. Employ the instructional plan written in Section II to teach to enhance student performance on this objective (1-2 class periods).

3. Reassess or evaluate and record the performance of your students, again, use the previously written evaluation plan (1 class period if necessary).

4. Consider the performance objective in light of the following criteria:

### Tryout Criteria

After having tried the performance objective with students, you should rate the objective according to the following criteria:

1. Is the BEHAVIOR called for satisfactory to you as a demonstration of achievement of this objective?

   If no, suggest how the behavior statement may be improved in the space provided on the Worksheet.

2. Are the CONDITIONS satisfactory to you as the "givens" under which the behavior to be observed in this objective is to take place?

   If no, suggest improvements in the conditions in the space provided on the Worksheet.

3. Are the STANDARDS specified in this objective satisfactory to you as criteria to which student behavior should conform?

   If no, suggest modifications in the standards in the space provided on the Worksheet.

## TRYOUT -- DIRECTIONS

Step

1. Use the evaluation plan written in Section II to assess and record the skill level of each student in your class on this objective (1 class period if necessary).

2. Employ the instructional plan written in Section II to teach to enhance student performance on this objective (1-2 class periods).

3. Reassess or evaluate and record the performance of your students, again, use the previously written evaluation plan (1 class period if necessary).

4. Consider the performance objective in light of the following criteria:

### Tryout Criteria

After having tried the performance objective with students, you should rate the objective according to the following criteria:

1. Is the BEHAVIOR called for satisfactory to you as a demonstration of achievement of this objective?

   If no, suggest how the behavior statement may be improved in the space provided on the Worksheet.

2. Are the CONDITIONS satisfactory to you as the "givens" under which the behavior to be observed in this objective is to take place?

   If no, suggest improvements in the conditions in the space provided on the Worksheet.

3. Are the STANDARDS specified in this objective satisfactory to you as criteria to which student behavior should conform?

   If no, suggest modifications in the standards in the space provided on the Worksheet.

4. Do you now perceive any deficiency in the way in which this objective is STATED?

   If "yes", suggest modifications in the way the objective is stated in the space provided on the Worksheet.

5. Do you now feel that the enabling objectives which lead toward mastery of the terminal behavior are SEQUENCED properly? (If appropriate)

   If no, write suggestions for changes, additions, or deletions in the space provided on the Worksheet.

Step

5. After writing all suggested revisions on the Worksheet, proceed to Consolidation of Section III.

## Consolidation -- Section III

All suggested changes in this objective based upon tryout with students should be incorporated into the statement of the refined objective as suggested on the Worksheet. This represents the product of this procedural model. The objective will, of course, be subjected to the Tryout cycle again and again, as you teach from year to year. However, you now have an objective which has undergone considerable scrutiny, and one which you may be confident is appropriate for your teaching situation and your students.

W O R K S H E E T

# HANDBOOK -- WORKSHEET

This Worksheet is to be used in conjunction with the Handbook for Selection and Refinement of Performance Objectives in Physical Education.

Write your prototype objective in the space below or on a separate page.

| | very high | high | moderate | low | very low | |
|---|---|---|---|---|---|---|
| 1. | ☐ | ☐ | ☐ | ☐ | ☐ | Relevance |
| 2. | ☐ | ☐ | ☐ | ☐ | ☐ | Subject Matter Value |
| 3. | ☐ | ☐ | ☐ | ☐ | ☐ | Feasibility |
| 4. | ☐ | ☐ | ☐ | ☐ | ☐ | Relate to Goals |
| 5. | ☐ | ☐ | ☐ | ☐ | ☐ | Motivational Quality |
| 6. | ☐ | ☐ | ☐ | ☐ | ☐ | Age Appropriateness |

DECISION: ☐ accept ☐ reject

## Section II. Examination - Part I

1. ☐ Yes ☐ No

Behavior:

2. ☐ Yes ☐ No

Conditions:

3. ☐ Yes ☐ No

Standards:

4. ☐ Yes ☐ No

Needed Changes:

5. ☐ Yes ☐ No

Needed Changes:

Consolidation - Section II - Part I

Incorporate all suggested changes from Criteria 1-5 into a revised statement of this objective:

Section II - Examination - Part II

Step

1. Evaluation plan - Write your proposed evaluation plan for this objective below.

Criteria - Part II

1. Rate this objective on the degree to which it was helpful to you in formulating an evaluation procedure.

| 1 | | 2 | | 3 | | 4 | | 5 | |
|---|---|---|---|---|---|---|---|---|---|
| ☐ | very helpful | ☐ | helpful | ☐ | moderate | ☐ | little help | ☐ | no help |

Suggested Changes:

Step

2. Instructional Plan - Write below the way in which you will go about teaching this objective.

| Focus | Class Plans | Formations and Equipment |
|---|---|---|
| | | |

Criteria - Part II

2. Rate this objective on the degree to which it was helpful to you in formulating an instructional plan.

1 ☐ very helpful 2 ☐ helpful 3 ☐ moderate 4 ☐ little help 5 ☐ no help

Suggested Changes:

Consolidation - Section II - Part II

Write the prototype objective, incorporating any suggested revisions, below. If no revisions were suggested, proceed to Tryout.

Section III - Tryout

1. ☐ Yes ☐ No change:

2. ☐ Yes ☐ No change:

3. ☐ Yes ☐ No change:

4. ☐ Yes ☐ No change:

5. ☐ Yes ☐ No change:

Consolidation - Section III

You have completed the Tryout section of this model. You should go through questions 1 - 5 and reflect any additional suggestions in the statement of the final version of this performance objective:

Refined Performance Objective

# APPENDIX D

# PARTICIPATION AGREEMENT

## APPENDIX D

## PARTICIPATION AGREEMENT

Agreement to participate in the field testing of this procedural model should be viewed as a learning experience as well as an opportunity to be a part of the development of a product which has potential utility for you, your staff, and your profession. With this in mind, you should not agree to participate unless you are interested in investing time and effort into such a professional undertaking.

Agreement to participate as a field test teacher in this project constitutes the following:

You Agree To:

1. Attend an initial orientation session designed to establish procedures.

2. Process 1 objective using a procedural model applying criteria and rating the objective. This includes:

    a) selection of objective
    b) examination of objective
    c) tryout with students in one of your classes

3. Supply the developer with feedback about the procedural model in the form of:

    a) a completed reactionnaire
    b) participate in a scheduled debriefing session with developer to get at deficiencies, alternatives and rationale in an attempt to improve the model

4. Attend a scheduled group meeting to consolidate the important revisions to be made by the author.

5. Process 1 objective using the revised model (supplying additional feedback in written and/or verbal form if necessary).

Upon satisfactory **fulfillment of the above,** You Receive:

1. **Credit for participation in the development of this procedural model in any printed work which results from this effort.**

2. **A copy of and familiarity with this procedural model.**

3. **The opportunity to receive graduate credit for your effort (in the form of independent study which can be arranged - see me if you are interested in this option).**

4. **Hopefully, some degree of professional satisfaction.**

5. **Certainly, my gratitude for your willingness to get involved.**

I agree to participate as a field test teacher in this project.

| Signature | Date | School |
|---|---|---|
| Home Address | Home Phone | School Phone |

# APPENDIX E

## TEACHER REACTIONNAIRE

# APPENDIX E

## TEACHER REACTIONNAIRE

NAME_____ DATE_____

Please be frank in answering the following questions. Remember, you are the prime source of information regarding what needs to be revised.

KEY: 1 = strongly agree; 2 = agree; 3 = uncertain; 4 = disagree; 5 = strongly disagree

| | | | | | |
|---|---|---|---|---|---|
| 1. This Handbook was well organized. I could easily follow the instructions. | 1 | 2 | 3 | 4 | 5 |
| 2. The vocabulary used contained many unfamiliar words. I often did not understand what was going on. | 1 | 2 | 3 | 4 | 5 |
| 3. The preface and introductory part of the Handbook were confusing. | 1 | 2 | 3 | 4 | 5 |
| 4. There was too much redundancy. I was bored by the repetition of ideas. | 1 | 2 | 3 | 4 | 5 |
| 5. The criteria listed under Section I-Selection would aid a teacher in selecting objectives for use. | 1 | 2 | 3 | 4 | 5 |
| 6. Teachers could use this Handbook effectively as it now exists. | 1 | 2 | 3 | 4 | 5 |
| 7. The Decision Aids used to illustrate main points are excellent. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8. | The cartoons included in the Handbook add nothing of value. | 1 | 2 | 3 | 4 | 5 |
| 9. | The Worksheet is organized in a useful format. | 1 | 2 | 3 | 4 | 5 |
| 10. | The idea of writing out the evaluation and instructional plan is tedious and unnecessary. | 1 | 2 | 3 | 4 | 5 |
| 11. | The three sections - Selection, Examination and Tryout - are necessary to process an objective properly. | 1 | 2 | 3 | 4 | 5 |
| 12. | This Handbook is a useful tool to teachers attempting to write or use performance objectives. | 1 | 2 | 3 | 4 | 5 |
| 13. | The Examination section of the Handbook presents useful criteria for identifying a proper objective. | 1 | 2 | 3 | 4 | 5 |
| 14. | The procedures suggested in the Tryout section of the Handbook are inappropriate for use in the gymnasium. | 1 | 2 | 3 | 4 | 5 |
| 15. | The Handbook could be reduced in length with no loss in effectiveness. | 1 | 2 | 3 | 4 | 5 |
| 16. | Teachers in physical education that are attempting to employ performance objectives in their teaching would use this Handbook if available on a widespread basis. | 1 | 2 | 3 | 4 | 5 |
| 17. | I would recommend extensive modifications to the Handbook before using it with other teachers. | 1 | 2 | 3 | 4 | 5 |
| 18. | I am interested in and/or favorably impressed with the idea of using performance objectives in teaching. | 1 | 2 | 3 | 4 | 5 |

19. What is the most difficult part of the Handbook?_____

_____

20. What is the best part of the Handbook?_____

_____

| | | | | | | |
|---|---|---|---|---|---|---|
| 21. When I receive my copy of this Handbook, I will use it regularly as a part of my teaching. | ___ 1 | ___ 2 | ___ 3 | ___ 4 | ___ 5 |

Briefly jot below any key ideas, or phrases, which should be mentioned during the debriefing session - particularly those which you feel will improve this Handbook.

# APPENDIX F

# TRYOUT RATING CHECKLIST

# APPENDIX F

## TRYOUT RATING CHECKLIST

| | | Weight |
|---|---|---|
| 1. Assessment | | |
| a. written evaluation plan | ___ yes ___ no | 3 |
| b. score sheet completed | ___ yes ___ no | 3 |
| c. written description - satisfactory | ___ yes ___ no | 3 |
| 2. Instruction | | |
| a. written instructional plan | ___ yes ___ no | 3 |
| b. teaching based upon assessment information | ___ yes ___ no | 3 |
| c. written description - satisfactory | ___ yes ___ no | 1 |
| 3. Reassessment | | |
| a. score sheet completed | ___ yes ___ no | 3 |
| b. written description - satisfactory | ___ yes ___ no | 2 |

Total = _____

Total Possible = 21

Minimum Acceptable = 15

# APPENDIX G

# OBJECTIVE RATING TEACHER DESCRIPTIVE DATA

Table G-1. Objective Rating Teacher Descriptive Data

| Teacher | Sex | Age | Highest College Degree | Years Teaching Experience | Date of Last Class Taken |
|---|---|---|---|---|---|
| A | F | 30-40 | M.A. | 10 | S.S. - 1974 |
| B | M | 20-30 | B.A. | 3 | S.S. - 1973 |
| C | F | 40- | B.S. | 14 | S. - 1974 |
| D | F | 30-40 | M.S. | 4 | S. - 1974 |
| E | M | 20-30 | B.S. | 1 | S. - 1974 |
| F | F | 30-40 | M.A. | 10 | S.S. - 1972 |
| G | M | 20-30 | B.A. | 1 | S. - 1973 |
| H | F | 20-30 | B.A. | 5 | S.S. - 1974 |
| I | F | 20-30 | A.B. | 3 | S. - 1974 |
| J | F | 20-30 | B.S. | 5 | S. - 1974 |
| K | M | 20-30 | B.S. | 1 | S. - 1974 |

# APPENDIX H

# PERFORMANCE OBJECTIVE RATING INSTRUMENT

MICHIGAN STATE UNIVERSITY EAST LANSING • MICHIGAN 48823

COLLEGE OF EDUCATION • DEPARTMENT OF HEALTH PHYSICAL EDUCATION AND RECREATION
WOMEN'S INTRAMURAL BUILDING Room 40 353-9428 or 355-4740

June 17, 1974

Dear

Enclosed please find the materials necessary to perform the objective rating task to which you agreed in our recent conversation.

Please fill out the Teacher Data Sheet which is enclosed. This information will be used only to describe the characteristics of the teachers who rated these objectives - your name is not necessary or important on this sheet.

Hopefully, the directions will be sufficient for you to complete this task; if not, please call me for clarification (collect if long distance).

I certainly appreciate your willingness to help me by completing this rating form. Your immediate attention would be appreciated; in fact, I am requesting that all raters enclose the Teachet Data Sheet and Performance Objective Evaluation Form (you need not return the criteria or objectives) in the stamped envelope within <u>two</u> (2) days of receipt of this packet.

Again, thank you in advance for your prompt attention in my behalf.

Sincerely,

Larry Carmichael

# PERFORMANCE OBJECTIVE RATING INSTRUMENT

DIRECTIONS:

Please evaluate each of the attached objectives by answering "yes" or "no" in the appropriate space on the Performance Objective Evaluation Form. (Your response should reflect your opinion of whether or not the performance objective satisfies each of the criteria below; do not attempt to project how others would view the objective in question)

CRITERIA

1. Does the objective call for an observable, measurable student behavior? (It should state what the student will be able to do as a result of instruction - not teacher behavior - not general behavior like to know or to understand.)

2. Are the conditions under which the behavior is to be demonstrated and evaluated stated and understandable? (The conditions are the "givens" of an objective - the description of the situation that will exist when the behavior to be learned is to be demonstrated. Such information as equipment to be provided, prerequisite learnings that are assummed and directions to be given the student may be described as a part of the conditions of a performance objective.)

3. Are the standards to which student behavior is to conform stated and understandable ? (This portion of the objective details how well the student must perform the behavior to be credited with having accomplished the objective. Such information as the number of times the skill must be demonstrated correctly, the key elements of a movement that must must be performed and the time or distance that must be achieved may be described as a part of the standards of an objective.)

4. Is this objective stated in precise and understandable language ? (The objective should contain familiar terminology written in an easily understood format.)

5. Does this objective contain enough specific information to be helpful to you in planning how you would evaluate the performance of students on this objective ? (In other words, does the objective help you think of the equipment, organization and strategy you would use to evaluate whether or not students had attained this skill?)

6. Does this objective contain enough specific information to be helpful to you in planning for teaching this skill to students ? (For example, does this objective help you think of the focus of the instruction, how you might introduce, teach and practice this skill and the class organization and equipment needed ? That is, the objective does not tell you how to teach; but should provide you with information helpful in planning your teaching.)

PERFORMANCE OBJECTIVES

1. To kick (toe) a ball showing proper form: follow through, planting of the foot, keeping eye on the ball.

2. Given a verbal request, the learner can pitch a regulation softball 30' with the ball entering the strike zone of the hitter 8 of 10 times.

3. To demonstrate proper starting ability.

4. To be able to pitch a softball with proper form and satisfactory accuracy.

5. To teach children to throw a rubber ball at a target.

6. The student can demonstrate a mature two-handed strike of a 4" plastic (wiffle) ball with a plastic bat off of a batting tee:
   a. feet shoulder width apart pointing at the tee
   b. controlling hand on top and behind the bat while the other hand is below and in front of the bat handle
   c. elbows away from body, grip near dominant hand shoulder
   d. bat is swung parallel from dominant shoulder to other shoulder, weight shifting with full swing
   e. eyes watching "spot" on ball at all times

7. To kick a ball with proper form.

8. Given a verbal request, a demonstration and a fleece ball, the student can throw the ball with a mature overhand throw hitting a 3' square target set 1' off the ground from a distance of 20', 3 out of 5 times.

9. To be able to strike an object with accuracy.

10. Given the verbal cue, "on your marks, get set, go", two tries and using a starting block, the student will be able to demonstrate the mechanics of a short sprint (50, 100, 220) start as characterized by:

    1. arm, head, leg, back position and their respective changes from mark, set, go

    2. demonstrate leg thrust and opposite arm-leg action coming out of block

    3. demonstrate the gradual rise of the body from the block to about 20 yds.

## Performance Objective Evaluation Form

| Objective Number | 1 (Behavior) | 2 (Conditions) | 3 (Standards) | 4 (Clearly Stated) | 5 (Evaluation Plan) | 6 (Instructional Plan) |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |

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