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Performance-based training: Attitudes and use in U.S. organizations

Kalamas, David Joseph, Ph.D.
The Ohio State University, 1990
PERFORMANCE-BASED TRAINING: 
ATTITUDES AND USE IN U.S. ORGANIZATIONS

DISSERTATION

Presented in Partial Fulfillment of 
Requirements for the Degree 
Doctor of Philosophy in the 
Graduate School of the 
Ohio State University 

by 
David J. Kalamas, B.S., M.A.

* * * * *

The Ohio State University

1990

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To my parents, whose advocacy of education continues to influence me
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Major Field: Educational Studies

Studies In: Training and Development, Dr. James E. Sage

Adult Education, Dr. William D. Dowling

Instructional Theory, Dr. John B. Hough
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CHAPTER I
INTRODUCTION

Introduction to the Problem

At the end of World War II, the United States was the dominant world power, both militarily and economically. This position, however, had gradually abated over the past 20 years.

To remedy this situation hundreds of billions of dollars have been devoted to capital equipment expenditures. However, as the literature (Dowling, 1988; Nussbaum, 1988) indicates, although productivity gains were and are being realized with these investments, this is only a temporary solution. The return on investment is diminishing because the U.S. workforce has become increasingly ill-equipped to deal with the rapid changes brought about by global competition. As stated by Sprow (1988) capital investment in new technology, while neglecting investment in human capital, has created an economy increasingly less capable of significant productivity gains.

According to a BusinessWeek (September, 1988) special report entitled Human Capital: The Decline of America's Work Force, the U.S. gross national product increased at an average annual rate of 3.2% during the period 1940 to 1982. Approximately one-third of that growth
is attributed to an increase in the U.S. educational level, one-half to technological innovation, but just 15% to capital equipment expenditures.

Currently in the United States, there is an ever-increasing realization that organizational productivity and competitiveness is directly linked to the skills and knowledge of the workforce (Hudson Institute, 1988; White, 1988; Good, 1989; Carnevale, 1989; Yeomans, 1989). Expenditures by U.S. industry for employee training provide evidence of concern about development of U.S. human capital. Estimated current direct expenditures for formal employee training range from $30 to $40 billion (ASTD, 1987; Lee, 1987; Feuer, 1988; Carnevale, 1989). The American Society for Training and Development (ASTD) reports a trend toward greater expenditures based on the result of a 1989 HRD Executive Survey of approximately 200 Fortune 500 HRD executives. According to the survey results, 70 percent of the companies had increased direct expenditures during the last three years and said that they planned to spend even more during 1990. Estimates of the relative annual education and training expenditures for higher education by the military establishment, by employers, and by the Federal government are depicted in Figure 1.
Little data exist that describe how these monies are being expended, especially in terms of performance-based training (PBT) (Carnevale, 1983; 1989; Eurich, 1985; Feuer, 1985, 1988; Lee, 1987; Toppins, 1989).

Statement of the Problem

U.S. industry spends large sums of money on employee training for the purposes of increasing organizational productivity and global competitiveness. However, little data exists about how organizational leaders make decisions about how training monies are to be spent, nor about how training programs will be designed and implemented. More specifically, little information is known about instructional models used to develop and implement instructional systems. The purpose of
this study was to examine one such model, the performance-based training (PBT) instructional model, in relation to trainers' attitudes toward using performance-based training and the perceived use of performance-based training approaches in U.S. organizations.

**Research Questions**

The problem investigated by this study was related directly to the productivity and competitiveness of U.S. industry. It was based on the assumption that there is a need for better data for organizational leaders to use in making decisions about spending training monies. The ability to make informed choices about instructional models increases the potential for better use of training monies. The following research questions were used to collect information about trainers' attitudes toward one such model, performance-based training, and the perceived use of this model.

1. What are the trainers' attitudes toward performance-based training approaches?
2. What are trainers' perceptions about the extent of performance-based training use?

**Significance of the Study**

**Introduction**

The significance of the study is related directly to the lack of data available to decision makers in U.S. business and industry about appropriate instructional systems. The literature provides few clues as to the perceived efficacy of instructional models applied in other than educational settings, and data that describe the use of any given instructional model in U.S. companies is practically non-existent.
Without sound data to support training and development decisions, monies that could be devoted to other purposes may be spent on ineffective training activities.

For a number of years, the performance-based training model has appeared regularly in the training and development literature, which would indicate that it is being employed on some scale. Whereas some training and development practitioners purport the performance-based training model to be very useful in the development of effective instructional systems (Evans, 1985; Blank, 1982; Norton, 1985; Zemke, 1982; Moore, 1984; Penrose, 1985; Luxenberg, 1980; Cain, 1981; Sullivan, 1981; Beach, 1985; Campbell and Hatcher, 1989) others claim that it has limited use (Austin and Titus, 1988; Bunda and Sanders, 1979; Collins, 1983; Nitko, 1989). Data about the perceived use and effectiveness of performance-based training can serve to help organizational decision makers make appropriate decisions about the design of instructional systems for employee training. The remainder of this section explains and clarifies the need for this study.

**U.S. Productivity and Competitiveness**

According to a *BusinessWeek* special report published in September, 1988:

Manufacturing superiority is being forfeited to the Japanese. The $150 billion yearly trade deficit and a foreign debt of half a trillion dollars reflect the inability of a large percentage of the American workforce to compete effectively in an integrated world economy. (p. 101)

Likewise, the American Society for Training and Development (ASTD) in their *National Report on Human Resources* (May/June, 1987) cites
demographic shifts and rapid technological change as factors contributing to the U.S. productivity/competitiveness problem. Corbin (1987) in an address to the ASTD 43rd national conference described the United States as once an "isolated supremacist economy" that now faces global competition and an unpredictable economy.

**U.S. Workforce Skills and U.S. Competitiveness**

The United States' success in a competitive economy, as seen by Carnevale (1989) is a function of workforce skills and knowledge. He notes that education and training are critical to the productivity and competitiveness of U.S. companies and, consequently, the whole nation. He contends that employee formal education and on-the-job learning have had more impact on productivity during this century than capital investment. Yeomans (1989) echoes this view and concludes that if companies wish to survive in the competitive environment of the nineties, they must have competent people.

However, Carnevale, Gainer, and Meltzer (1989), in the Hudson Institute report *Workforce 2000: Work and Workers for the 21st Century*, contend that working against workforce improvements are a "volatile mix of economic, demographic, and technical forces creating a "human capital deficit" (p. 11). This mix of forces will create higher level skill requirements for jobs in the coming years. They predict that only 27 percent of all new jobs will fall into low-skill categories as compared to 40 percent today. They also predict that jobs that currently fall in the middle of the skill distribution will be the least skilled occupations of the future.
In addition to increasing skill level requirements for new jobs, the Hudson report projects that the continuing decline in the population will create an older workforce, with the number of younger workers (aged 16-34) declining both relatively and absolutely. Further, 80% of workforce entrants will be minorities, women, and immigrants. These changes will create a diminishing pool of qualified workers and the most serious skill shortages since World War II.

Unless increased investment in employee training is undertaken U.S. companies will be unable to obtain the types of workers necessary to allow them to compete in international markets (U.S. Department of Labor Commission on Workforce Quality & Labor Market Efficiency Report, 1989). According to an article in BusinessWeek (September, 1987), Japanese successes in manufacturing are directly linked to their better educated workforce. The Japanese functional literacy rate of 95%, compared to the U.S. rate of about 80%, is cited as indicative of these successes. White (1988) contends that much of Japan's manufacturing successes stem from the fact that Japanese blue-collar workers are more capable than their U.S. counterparts. He feels that Japanese workers can interpret advanced mathematics and read complex engineering blueprints far better than U.S. workers.

Finally, failure to invest in training and formal apprenticeship programs have resulted in a "technology gap" (Sprow, 1988). Good (1989) notes that changing technology requires better training if employees and their organizations are to stay "on top." Sprow contends that unless this gap is closed by appropriate employee training, more advanced technologies cannot be put in place. Heltgott (1988) also points out
that failure to train employees adequately will cause costly manufacturing systems to breakdown as attempts are made to utilize more advanced, sophisticated technologies.

**U.S. Response to Workforce Training Needs**

U.S. industry's annual expenditures for employee training are substantial. Carnevale (1989) estimates that $30 billion is being spent on formal employee training. Lee (1987) in *Training Magazine's Industry Report 1987* notes that $32 billion was budgeted for training and development activities in 1988. The American Society for Training and Development in *Serving the New Corporation* (1986), estimates the cost of informal learning (on-the-job) to be $180 billion annually. Feuer (1988), in *Training's Industry Report 1988*, notes that most companies predicted an increase in training expenditures for 1989. The Conference Board in a 1985 study found that, for the 1980-1985 period, both the number of employees participating in training and the number of training professionals employed by companies participating in the study had increased.

How these monies are being expended by industry can be answered partially by the results of annual studies conducted since 1982 by Lakewood Research, a division of the Lakewood Publications, the publishers of *Training* magazine. The reports from the studies provide data on the sources of training, who receives training, general types of training (e.g., supervisory, clerical), specific types of training (in terms of content), and instructional methods (e.g., lecture, role play). What the reports fail to do is indicate the types of instructional models employed for instructional system design. Studies by Eurich
(1985), Roth (1985), Lusterman (1985), Carey and Alan (1984), and Carnevale (1989) provide similar data but again, no data exist on types of instructional models employed.

The Performance-Based Training Model

Instructional systems are based on instructional models that are in turn based upon theories of learning or theories of instruction (Romiszowski, 1981). The performance-based training model was chosen for this study primarily because it is viewed in the literature as a potentially powerful design in terms of assuring attainment of defined learning outcomes (Austin and Titus, 1988; Norton, 1985; Hanurem and Hansen, 1989; Blank, 1982; Beach, 1985; Zemke, 1982; Penrose, 1985; Cain, 1981; Moore, 1984; Luxenberg, 1984; Evans, 1985; Campbell and Hatcher, 1989).

Evans (1985) notes that the nuclear industry guidelines for instructional system design support performance-based approaches because they provide "accountability" that is, specific objectives are set and achievement of the objectives can be documented. Feuer (1985) points out that a performance-based training system for employees of the General Public Utilities Three-Mile Island nuclear power plant, was put in place after the much-publicized accident of 1979. Feuer (1985) also noted that Florida Power Corporation employs performance-based approaches for training groundmen, apprentices, and journeymen. Campbell and Hatcher (1989) content that "a growing number" of performance-based training programs are being used because of the focus on the ability to perform job tasks with measurable proficiency.
Austin and Titus (1989) indicate that performance-based training is very effective when designed and implemented properly. They note that learners who "take skillfully designed performance-based training courses" often succeed in mastering skill or knowledge. Austin and Titus (1989) point out that performance-based training is "particularly useful" for training programs aimed at employee job performance related directly to human safety.

Day (1984) the president of Dundalk Community College, attributes training success in the heavy industry sector to both the involvement of target groups in the training and development process and the use of performance-based training. He notes that this dual approach has been used successfully for training at steel plants and a number of other heavy industries in the school's service area.

Limitations of the Study

The following limitations pertain to this study:

1. Results of the study are generalizable only to the population defined by the national membership of the American Society for Training and Development during 1989.

2. The estimate of reliability for the scale designed in this study was limited to the statistical calculation of the Kuder-Richardson formula 21.

3. Instrument validity was based primarily upon expert opinion.

4. Sample size calculations were based upon estimates of population parameters.

5. The results of the study are limited to respondents' levels of understanding of the instrument questions.

6. The results of the study are limited to respondents' actual knowledge of PBT used in their organizations.
Assumptions of the Study

The following assumptions were made in conducting this study:

1. That the systematic sample drawn from the American Society for Training and Development (ASTD) membership directory was representative of the population of members.

2. That the data received from respondents were a valid and reliable source for the measurement of respondents' attitudes, the description of the respondents, and the description of the use of performance-based training.

3. That the universe of content defining the construct performance-based training was described and sampled adequately.

4. That the respondents understood the questions asked in the study.

Delimitations of the Study

This study was delimited to include the following:

1. Only the population defined by the national membership of the American Society for Training and Development during 1989.


3. Only variables deemed most important in addressing the research problem and meeting the research objectives.

4. Data collected by using a mailed instrument.

Objectives of the Study

Addressing the research problem of this study was seen as requiring three objectives:

1. To collect and analyze data in order to examine the use of performance-based training in U.S. companies.
2. To collect and analyze data related to the attitudes of training and development practitioners about performance-based training.

3. To collect and analyze data related to variables other than attitude, such as size of organization, that might affect the use of performance-based training.

Terms

To help clarify the content of the succeeding chapters, the following terms have been defined:

Construct: In this study, an idea or perception resulting from a synthesis of information. Described by a list of distinctive features and components (Webster's New World Dictionary, 1986; Henerson, Morris, Fitz-Gibbon, 1978).

Competence: Achievement or acquisition of the knowledge, skills, and attitudes deemed necessary for a worker to perform given occupational tasks at a given level of proficiency effectively. Often termed skill or performance (Norton and Harrington, 1985).

Human Resource Development (HRD): The field or practice defined by the integrated use of training and development and career development to improve individual, group, and organizational effectiveness (Mclagan/American Society for Training and Development, 1989).

Instructional Model: In this study, a set of instructional design criteria based upon a single theory of learning and/or instruction or a number of learning and/or instructional theories. The instructional model is used to design all or part of an instructional system (Romiszowski, 1981).
Instructional System: A system created to facilitate learning in individuals. System boundaries defining the system are based upon instructional models, instructional theories, theories of learning, or some combination thereof. System elements are variables thought to affect instructional (learning) outcomes (Romiszowski, 1981).

Model: In this study, a generalized, hypothetical description used in analyzing or explaining something (Webster’s New World Dictionary, 1986).

Performance-Based Training: In this study, an instructional model employed to design, develop, and implement employee training programs loosely based upon the mastery learning model (Carroll, 1963; Bloom, 1968; Black, 1971). Model elements generally include the following five criteria:

1. Training is based upon job competencies (the knowledge, skills or attitudes required by a worker to perform given job tasks) that have been identified (e.g., by conducting a rigorous job/task analysis) and verified as truly being required for successful job or task performance.

2. The criteria to be used in assessing trainee achievement of the competencies are explicitly stated and known to the trainee.

3. The instructional program provides for the individual development and evaluation of each specified competency.
4. Trainees proceed at a pace most suitable for them and move forward only when they have demonstrated attainment of particular competencies.

5. Assessment of competency achievement requires actual performance of the competency.

Training and Development (HRD): The area of HRD practice aimed at identifying, ensuring, and--through planned learning--helping develop the key competencies that enable individuals to perform current or future jobs (McLagan/American Society for Training and Development, 1989).

Verification: The process of reviewing and confirming or refuting the appropriateness of occupational tasks (task/competency statements) (Norton and Harrington, 1985).

In summary, this chapter provided an introduction to the research problem, a statement of the research problem and research questions, an explanation of the significance of the study, and a summary of limitations, assumptions, delimitations, and objectives of the study. Terms helpful in understanding the study were also defined.

Chapter II provides a review of the literature related to the study.
CHAPTER II
REVIEW OF LITERATURE

Introduction

This review of literature was conducted to gather information necessary to address the research problem and answer the research questions noted in Chapter I. The review addresses four major areas:

1. Instructional systems
2. Performanced-based instructional systems
3. Attitude measurement
4. Survey research

The review was designed to provide both a synthesis of related literature and a review of conceptual/theoretical underpinnings considered helpful to understanding the study. Instructional systems were reviewed since performance-based training systems are only one among many general types of systems created by trainers to provide employee training.

The literature related to performance-based instructional systems was reviewed to 1) examine the origin and nature of performance-based training and, 2) investigate performance-based training usage and perceptions of performance-based training as an approach to the design of instruction.

Attitude measurement was investigated to acquire information that would provide direction in developing a scale to measure attitudes toward performance-based training. This review also included an
examination of instrument validity and reliability. The survey research literature was investigated to aid in development of appropriate methodology.

Instructional Systems

The Nature of Instructional Systems

In simplest terms an instructional system may be evidenced by the presence of precise learning goals and/or objectives and by testing (evaluation) of the system (Romiszowski, 1981). Gagne and Briggs (1979), when discussing the design of instructional systems, note that the process can be considered as:

The construction of an over-arching framework for accomplishing whatever variety of learned outcomes the course (curriculum) intends (p. 18).

Kemp (1985) describes an instructional system as a system created by application of a comprehensive plan incorporating the elements considered essential to reaching an identified goal. As Kemp notes this type of systematic approach to the development of instructional systems is based upon the systems approach to problem solving. The systems approach is based, in turn, upon the scientific method of inquiry whereby a problem is identified, a hypothesis aimed at solution of the problem is created, the hypothesis is tested by collection of relevant data acquired by observation, testing, and experimentation, and, finally, the hypothesis is confirmed or rejected (Kemp, 1985; Ary, Jacobs, Razavieh, 1979).

In systems theory, a system exists primarily by definition. Boundaries, the conceptual divisions between the system and its environment, are created according to the creator's purpose (Bershon and
Peters, 1981) and serve to define contrived (man-made) systems. All systems, both natural and contrived, are considered to exist in an environment from which they receive inputs and to which they deliver outputs (Romiszowski, 1981). Instructional systems, like any systems (depending upon the boundaries set), may be defined to include many different elements that could affect instructional outcomes. Examples of these elements would include learner characteristics, learning objectives, the learning environment, the nature of content, learning resources, instructional goals, evaluation strategies, and the nature of desired learner performances. Thus, an instructional system may be a very simple or very complex means, depending upon its defined boundaries, for achieving instructional goals. Informal, on-the-job training with a single "instructor" and a single learner might be thought of as a relatively simple instructional system. A nuclear power plant operator training program with operator tasks defined to multiple sub-levels, providing individualized learning materials and media, and requiring rigorous job-performance testing might be thought of as a more complex instructional system.

**Theories of Learning, Instruction and Instructional Systems**

Since instruction is concerned with facilitating learning in individuals, theories of instruction are necessarily based on theories of learning. Instructional systems then, are based on theories of learning and theories of instruction (Romiszowski, 1981). These theories may be considered as being rooted in many bases. These would include behaviorist psychology, gestalt psychology, systems theory,
cognitive development theory, knowledge structure theory and humanistic theory (Romiszowski, 1981; Kemp, 1985).

A comprehensive synthesis of the many dozens of theories of learning and instruction was considered beyond the scope of this review. It should be noted, however, that many theories and models do exist and are employed in the design of instruction and that performance-based training is based upon the mastery model developed primarily by Carroll (1963), Bloom (1968), and Block (1971).

Performance-Based Instructional Systems

The Origin of Performance-Based Training

Performance-based training, as employed in business and industrial settings, has its roots in the mastery learning model developed primarily by Bloom (1968), Carroll (1963) and Block (1971) (Romiszowski, 1981; Blank, 1982; Norton and Harrington, 1985).

As Romiszowski (1981) notes, Carroll (1963) defined aptitudes as measuring the time necessary to learn a given task under "ideal" instructional conditions. Thus, Carroll viewed the degree of learning that occurred as a function of the ratio of time actually spent learning to the time that was needed (based upon a given aptitude). Bloom (1968) used Carroll's theoretical model to develop a practical mastery model for implementation in the educational classroom. Mastery was achieved when the student exhibited content and cognitive behaviors (met the major learning objectives). Major learning objectives were broken down into unit objectives. Mastery of the unit objectives was defined as necessary for mastery of the major objectives. Instruction was group-based, but learners received formative feedback via tests based on the
unit objectives. Block (1971) further refined the mastery model by adding supplemental instruction for students until learning was achieved. Then group instruction continued.

The mastery model was further refined by many educational practitioners and termed competency-based education (CBE). Romiszowski (1981) CBE as mastery learning plus modular, individualized instruction.

Training Versus Education

PBT, as the term implies, is concerned with training. To understand the PBT model it is helpful to understand differentiations made between training and education.

As Laird (1978) noted, "Not all training specialists distinguish between 'education' and 'training'..." Many do, however. Nadler (1979) viewed training as activities designed to improve current job performance or future job performance. Education, he said, included human resource development activities designed to improve the overall competence of an employee "in a specific direction and beyond the employee's current job" (p. 8).

Romiszowski (1981) conceptualized education as a sub-system of a societal system with goals that include providing opportunities for quality-of-life improvement for society members, more effective use of the society's resources, and maintenance of beliefs, values, customs, structures, and traditions. Training, on the other hand, is viewed as a sub-system of industrial organizations, with goals that include opportunities for work-force improvement, maintenance of the ability to compete, and the capability to change and adjust to a changing business
environment. Both sub-systems' goals are viewed as having qualitative and quantitative characteristics.

Thus, training, as Nadler (1979) notes, can be thought of as primarily job-related, while education can be thought of as primarily individual-related. This differentiation is made to point out that performance-based training, sometimes termed competency-based training (CBT), is generally viewed as different from competency-based education (CBE) in terms of goals or aims (Blank, 1982). In this review competency-based training will be considered essentially synonymous with performance-based training.

Competency-Based Education

Recent years have witnessed an increased societal emphasis on the certification of competency or, stated somewhat differently, certification of one's ability to perform a given set of tasks (Grant, 1979). Riesman (1979) notes that, in his view, a demand by society for "demonstrated competency" now motivates some educational practice.

In a general sense, Finch (1983) feels that CBE has emerged as a major "thrust." Knaak (1977) also agreed that the concept of competency-based education has had a great impact on educators. Hayenga and Isaacson (1980) also contend that CBE reflects a demand for "new kinds" and "higher levels" of competency in many functional areas. They feel that an educational system that focuses upon "single-setting applications" of knowledge and skill in an era of rapid social and technological change risks producing ill-equipped students. They also suggest that competency-based approaches might produce more "holistic" and "flexible" educational systems. Bunda and Sanders (1979) point out
that they see those who affect the operation of public education in the U.S. (law makers, school board members) as moving toward the acceptance of CBE as a reform mechanism. These references are cited to establish perspective in relation to PBT approaches and to differentiate between PBT/CBT and CBE.

**Industry-Based Training**

In contrast to the public education competency-based education literature, is the training and development literature. This literature base, supporting the training and development/HRD field, may be considered underdeveloped. In terms of empirical studies and descriptive studies this state of affairs might be attributed to two factors. First, many of the empirical studies are conducted in-house -- companies with sufficiently large staffs conduct them, use the results internally, and treat them as proprietary information. Second, the field of training and development/HRD is in its infancy. For example, only within the last 10 to 15 years have universities become interested in employee training and development. The *ASTD Directory of Academic Programs in Training and Development/Human Resource Development* (1984) listed only 55 doctoral programs. Of these 55, only a few had a pure training and development/HRD focus.

The American Society for Training and Development established its first Research Committee in 1978. (Peterson, 1978) This committee reviewed papers for the 1978 ASTD National Conference. The 12 papers presented at the conference were the first collected and disseminated by the Society. One of the charges of the Research Committee was to encourage training and development practitioners to conduct:
Systematic study of some aspect of training and development involving the collection and analysis of data in a realistic setting (p. vii).

McCullough (1981) in the introduction to Models and Concepts for T&D/HRD Academic Programs noted that:

Ten years ago, we could not have offered this title to the HRD community. Its publication in 1981 is testament (a) to the growing recognition by academic institutions and their leaders that HRD plays an essential role in the world of work; and (b) to the ongoing need of current and would-be HRD practitioners for the secure professional footing provided by degree-granting programs (p. i).

McLagan (1983) in Models for Excellence: The Conclusion and Recommendations of the ASTD Training and Development Competency Study reports that the study was commissioned to "help the training and development field position itself as a definable field with a definable body of knowledge" (p. 2). A follow-up study further defining the field, Models for HRD Practice, was published in mid-1989. These references provide an indication of the status of the field.

Employment of Performance-Based Training

Campbell and Hatcher (1989) in discussing performance testing for manipulative tasks note that;

A growing number of training programs are becoming performance-based, focusing on the trainees' ability to perform tasks with the proficiency required for success on the job (p. 1).

Austin and Titus (1989) in discussing some of the limitations of performance-based training noted that in their opinion, it has served very well over time in solving clearly defined technical skill or
knowledge deficiency problems. A major limitation, as they see it, is the utility of performance-based systems when deficiencies are not easily definable.

Evans (1985), in discussing instructional design in the electric utility industry noted that:

"...the nuclear industry has its own oversight and support agency in the Institute of Nuclear Power Operations (INPO) which among other support groups has a training accreditation section. The section members have written comprehensive guidelines for systematic curriculum development and delivery. The guidelines ...foster a criterion/performance-based approach (p. 6)."

Application or employment of performance-based training designs can be thought to lie on a continuum. The point assigned on the continuum would be determined by the degree or level to which competencies are analyzed, the level to which conditions of performance and achievement criteria are taken, the degree to which instructional materials are individualized, and the rigorousness of performance evaluation. Two design examples lying at opposite ends of this continuum would be nuclear power plant operator training and bank teller training. Zemke (1985) noted that operator training at General Public Utilities Nuclear Corporation is based on very well-defined operator tasks. For example, operators are tested by demonstrating their knowledge and skill in a multi-million-dollar simulator that is a duplicate of an actual plant control room. Operators must be certified, tested periodically and attend requalification classes every seven weeks for four or five days. Training is very structured.

Beach (1985) offers an example of a less-structured system. Her example of a bank teller training program describes performance-based
training that is based upon a DACUM chart of competencies derived by an expert panel. DACUM (Developing A Curriculum) is described by Norton (1989) as a method for determining important job tasks and the skills, knowledge and behaviors that are required for task performance. An expert panel is selected from the job or occupational area of interest and works with a facilitator to identify and sequence job duties and job tasks. It also identifies tools, equipment, supplies, materials, worker traits, attitudes, and prerequisite skills. The program Beach describes is analyzed to fewer levels in terms of tasks and contains less individualized instructional materials. This design is less structured due primarily to resource limitations and the fact that the type of training being addressed is not critical in terms of human health and safety.

It is noteworthy that the references that were located described the use of performance-based approaches in a number of types of organizations. For example, Florida Power Corporation (Feuer, 1985), an electrical power company, employs a performance-based approach for the training of groundmen, apprentices, and journeymen. Zemke (1982) described performance-based approaches at an Alabama hospital (nursing training), a nuclear power plant (plant operator positions), and a Texas-based franchising operation (management training). The American Management Association (AMA) cut across organizational types by the introduction of its Management Competency Program (master's degree program in management) (Daloisio, Firestone, and Evarts, 1983). This management program was based on managerial competencies (non-industry specific) identified by McBer & Company, a behavioral research firm.
Fabian and Mink (1981) reported on a training and employee development program for line managers in an underground mining equipment manufacturing company, while Sullivan (1981) reported on data processing training at an insurance company. Hayenga and Isaacson (1980) discussed a number of different users, specifically citing PLATO (Personalized Learning and Teaching Opportunity) as a prime example of the use of a competency-based training and education approach delivered by a computer. This system is widely employed in a number of different kinds of organizations, including the organization that developed it—Control Data Corporation. Moore (1984) conducted an evaluation study of a competency-based program for secretarial and clerical employees at a large eastern insurance company. Other industries cited were, the airline industry (Cain, 1981), the communications and banking industries (Luxenberg, 1980), and the railroad industry (Penrose, 1985).

These references would seem to indicate that the use of performance-based approaches is occurring in many different industries. The focus of these references also appears to be on measurable training outcomes.

**Basic Elements of Performance-Based Training**

How are performance-based approaches to training generally characterized? The literature indicates that a number of elements or characteristics should be present if a program can be termed performance-based.

Elam (1971) described what he considered essential elements of performance-based training. He concluded that the competencies to be demonstrated at the completion of training should be "role-derived,"
specified in specific behavioral terms, and be made known to trainees. In terms of assessment criteria he contended that they should be based upon the stated competencies, have specified levels denoting mastery of the competencies, and also be known to trainees. The prime evidence of performance was to be actual performance, coupled with an assessment of knowledge. In his scheme trainee progress toward competency attainment would be based upon demonstrated performance.

Blank (1982) described four sets of characteristics that he felt distinguished between competency-based and more traditional training programs. He concluded that competency-based programs should be based solely on specific, precisely stated student outcomes (usually called competencies or tasks). In addition he felt that these tasks should be recently verified by members of the occupational group as being essential for successful employment in the occupation, available to instructor and trainee, and describe exactly what the trainee would be able to do upon completing the training program.

Blank viewed learning activities and materials as necessarily being trainee-centered, allowing for self-pacing, with periodic feedback built into the system. In his scheme mastery is linked directly to provision of adequate learning time and performance demonstration in a job-like setting. Performance is compared against a predetermined, fixed standard.

Norton and Harrington (1985) noted that "... there are five essential elements ... those elements must be present before an instructional program should be declared competency-based" (p. 4). They describe these elements as follows:
First, the competencies to be achieved must be rigorously identified, verified, and made public in advance of instruction.

Second, the criteria to be used in assessing achievement and the conditions under which achievement will be assessed are explicitly stated and made public in advance.

Third, the instructional program provides for the individual development and evaluation of each of the competencies specified.

Fourth, students progress through the instructional program at their own best rate, by demonstrating the attainment of specified competencies.

Fifth, assessment of competency takes the student's knowledge and attitudes into account but requires actual performance of the competency as the primary source of evidence. (p. 4)

Knaak (1977) also felt that five elements characterized a competency/performance-based approach. He included in his characteristics five elements -- 1) a determination of information or skill to be learned, 2) stated behaviors and criteria, 3) group-centered and individualized learning activities, 4) progress based on testing of mastery at a specified level, and 5) criterion-referenced testing.

Evans (1985) summarized the activities involved in creating a performance-based system. In his view, these steps or activities included:

1. Identifying instructional outcomes, often including those that relate to the ability to function effectively in life or work-related roles.

2. Developing evaluation and assessment procedures that will measure the attainment of the outcomes.

3. Developing systematic instructional programs that are designed to attain the outcomes.
4. Developing record-keeping systems that certify the attainment of the outcomes.

As Bershon and Peters (1981) noted, the models described above are essentially of the closed-loop or closed-system type with the system boundaries defined by learning objectives (behavioral) and the measurement of objective mastery. This broadly defined model appeared most often in the literature.

As noted earlier, the literature suggests that these models and their consequent instructional systems lie on a continuum determined primarily by the rigorousness of task/job analysis conducted to create task-specific behavioral objectives and the rigorousness of performance measurement. Campbell and Hatcher (1989) noted that highly defined instructional systems are utilized by the military, nuclear power, airline, chemical, and other industries where a high level of certitude about trainee learning is required in order to minimize human risk or process errors.

**Traditional Instruction Versus PBT**

A number of differences exist between "traditional" instructional models and systematic design models of the PBT type. Blank (1982), Norton (1985), and Hanuum and Hansen (1989) point out that systematic instruction can, among other things, reduce learning time, provide better measurement of learning outcomes, and produce greater mastery of tasks. Table 1 summarizes characteristics of a typical traditional model and the a typical PBT model. Figure 2 lists tasks commonly completed to develop a PBT program. Blank (1982) suggests that traditional, instructor-centered learning activities of fixed time
length are likely to produce a distribution of test scores reflecting varying abilities. That is, a distribution approaching a standard distribution. On the other hand, learner-centered activities combined with adequate learning time and planned remediation are likely to produce a skewed distribution with 80-90% of learners reaching a high level of mastery or proficiency, results typical of well-designed systematic instruction.
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Traditional Instructional Model</th>
<th>Performance-Based Training Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumptions About Learners</td>
<td>• assumes learners will reach varying levels of proficiency</td>
<td>• assumes most learners will reach high levels of proficiency</td>
</tr>
<tr>
<td></td>
<td>• generally stated in broad terms (if stated)</td>
<td>• specific, based upon job and task analyses</td>
</tr>
<tr>
<td></td>
<td>• sometimes stated in terms of instructor performance</td>
<td>• stated in terms of learner performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• known in advance by learners</td>
</tr>
<tr>
<td></td>
<td>• sometimes must be intuited by learners</td>
<td></td>
</tr>
<tr>
<td>Learner Analysis</td>
<td>• relies on assumptions about learner capabilities</td>
<td>• learner capabilities assessed prior to entry</td>
</tr>
<tr>
<td>Remediation</td>
<td>• generally not planned</td>
<td>• planned remediation systemic</td>
</tr>
<tr>
<td></td>
<td>• no alteration of instructional techniques</td>
<td>• alternatives systemic</td>
</tr>
<tr>
<td>Testing</td>
<td>• grade assignment</td>
<td>• learner feedback</td>
</tr>
<tr>
<td></td>
<td>• norm-referenced</td>
<td>• determination of mastery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• criterion-referenced</td>
</tr>
<tr>
<td>Characteristics</td>
<td>Traditional Instructional Model</td>
<td>Performance-Based Training Model</td>
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<td>-----------------------</td>
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<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Course/Program Progression</td>
<td>• pace established primarily by course design</td>
<td>• pace set by learner</td>
</tr>
<tr>
<td></td>
<td>• few progression criteria</td>
<td>• progression based upon task mastery</td>
</tr>
<tr>
<td>Course/Program Evaluation</td>
<td>• often does not occur</td>
<td>• planned, formative and summative</td>
</tr>
<tr>
<td></td>
<td>• emphasis on inputs and processes</td>
<td>• emphasis on outcomes</td>
</tr>
<tr>
<td>Entry</td>
<td>• static</td>
<td>• variable</td>
</tr>
<tr>
<td>Media and Methods</td>
<td>• generally based on preference or availability</td>
<td>• based upon learning objectives, instructional theories, learning theories</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• chosen with consideration of individual differences</td>
</tr>
<tr>
<td>Sequence</td>
<td>• based upon content/topic logical progression and relationships</td>
<td>• based upon learning prerequisites and learning principles</td>
</tr>
<tr>
<td>Completion Time</td>
<td>• set</td>
<td>• variable</td>
</tr>
<tr>
<td>Exit</td>
<td>• determined by norm-referenced evaluation</td>
<td>• based upon demonstrated task mastery, criterion-referenced evaluation.</td>
</tr>
</tbody>
</table>
The benefits noted above and a number of others can be traced to PBT design characteristics. Particularly important is the definition and validation of learning objectives (Norton, 1985). Learning objectives are based upon job/task analyses (Romiszowski, 1981; Blank, 1982). The basic output of these analyses is a description of the components of a given job. The overall hierarchical structure into which most jobs can be analyzed is displayed in Figure 2.

Duty statements describe the general work behavior of a job (Sage and Rose, 1985). A task (Romiszowski, 1981) can be defined as a sequenced set of interrelated activities which leads to a measurable result. There is also a triggering event, stimulus, or cue which initiates execution of the task and a terminal event which indicates task completion. Task analysis takes many forms and can be conducted to a number of levels. For example, an analysis can consist of a simple listing of elements, elements listed and categorized by type of
performance and difficulty, elements described by stimulus-response operants (Skinner, 1961), flow-charting sequences, hierarchical analysis, elements described by various taxonomies (Gagne, 1965; Mager and Beach, 1967; Merrill, 1983; Romiszowski, 1986), and so on.

These analyses are also important (in addition to being useful for establishment of objectives) in that they form the basis for development of other elements that characterize a PBT system. Job task analysis data provides data for course tests, instructional sequences, and course prerequisites. They also aid in development of the evaluation system, instructional methods, and course content (Romiszowski, 1981). Figure 3 lists tasks commonly associated with development of a PBT program.

Thus, predetermined and validated job tasks, which form the basis for validated learning objectives, provide a means of measuring learning outcomes, both formatively and summatively. Other elements (planned learner feedback, individualization, advance organizers) are based directly upon various theories of learning and instruction. Figure 4 shows a learning-evaluation model typical of PBT programs.
DEVELOP AND VALIDATE PERFORMANCE TESTS
DEVELOP AND VALIDATE WRITTEN TESTS
VERIFY JOB TASKS
DETERMINE METHODS
SEQUENCE OBJECTIVES
VALIDATE OBJECTIVES
IDENTIFY PREREQUISITES
CONDUCT JOB/TASK ANALYSIS
DEVELOP TERMINAL AND ENABLING OBJECTIVES
DEVELOP AND VALIDATE PERFORMANCE TESTS
DEVELOP AND VALIDATE WRITTEN TESTS
DETERMINE METHODS
DEVELOP LEARNING MATERIALS, MEDIA
DEVELOP LEARNING MANAGEMENT SYSTEM

Source: Adapted from W.E. Blank, 1982

FIGURE 3.
PBT PROGRAM DEVELOPMENT TASKS
LEARN TO PERFORM TASK

ENTRY

- Receives formal instruction
- Reviews prepared materials
- Views instructional media
- Uses manuals
- Observes demonstrations
- Practices skill in laboratory
- Receives assistance and advice
- Other activities

- Instructer observes performance
- Attempts task
- Rates own performance

Satisfactory performance of task?

- Yes
- Exit

- No

Variable time line
PBT Versus Other Instructional Models

A number of models exist that are used to design instructional systems. Hanuum and Hansen (1989) collectively termed them "systematic" models. In the Hanuum and Hansen view, the ISD (Instructional Systems Development or Design), TSD (Training Systems Development), SAT (Systems Approach to Training) and PBT (Performance Based Training) and other similar models can be grouped into this category to differentiate them from what they term "traditional" design models.

The literature suggests (Romiszowski, 1981; 1986; Carkhuff, 1984; 1985; Grafinger, 1988; Hanuum and Hansen, 1989) that, in a basic sense, one systems approach to training development can describe most models. This basic model is depicted in Figure 5.

Source: M.J. Rosenberg, 1982

FIGURE 5.
BASIC SYSTEMS DEVELOPMENT MODEL
Grapper and Ross (1987) suggested that there was general agreement on major instructional design tasks, but much less agreement upon methods for completing the tasks. Thus, variation exists among the various models in terms of analytic and prescriptive components. Figure 6 illustrates a typical systems development model (Romiszowski, 1981) providing slightly more analytic and prescriptive direction. Varying levels of detail and comprehensiveness can be noted in many other models.
FIGURE 6.
TYPICAL SYSTEMS DEVELOPMENT MODEL

Source: A.J. Romiszowski, 1981
A number of similarities appear to exist between PBT and other systematic models. These would include job/task analysis and verification, learner analysis, objective development and validation, test development and validation, multiple media and methods, and system evaluation. Differences appear to center around certain PBT program characteristics (Norton and Harrington, 1985; Norton, Harrington and Ciccone, 1987; Blank, 1982; Knaah, 1977; Elam, 1971). These include pace, structure, and progress. As opposed to most program structures, pace is variable, not time-based. Overall structure is based upon job competencies in a modular format. Progress through the program is based upon demonstrating mastery of designated competencies. If mastery is not demonstrated the process becomes iterative -- the trainee undertakes additional work until he or she can successfully demonstrate mastery. Then progression to the next designated competency is permitted. Program exit (job competence) is based upon attainment of all designated competencies, although test-out may be allowed if warranted by trainee ability to demonstrate mastery of some competencies. Competence, as defined earlier, is the achievement or acquisition of the knowledge, skills and attitudes deemed necessary for a worker to perform given occupational tasks at a given level of proficiency effectively (Norton and Harrington, 1985). Figure 7 illustrates the PBT program structure.
Positive and Negative Characteristics of Performance-Based Approaches

The research problem of this study required development of an attitude scale to measure training and development practitioner attitudes toward the construct performance-based training. This task was accomplished, in part, by an examination of the literature aimed at uncovering recurrent positive and negative reactions to or feelings about performance-based (competency-based) approaches.

Blank (1982) provided a list of perceived negative characteristics that he termed "myths" based upon misconceptions and preconceived notions about the nature of PBT and the impact it might have on those involved in program implementation. These are listed below. They are representative of views expressed in the literature (Bunda and Sanders, 1979; Kasworm, 1980; Lange, 1986; Verdium, Miller and Greer, 1977; King;
1. The competency-based approach to training is an attempt to eventually phase out instructors.

2. This approach works well only with better students.

3. It is mechanical and inhumane and students don’t really like it.

4. It stifles instructor creativity.

5. Cramming the same competencies and objectives down every student’s throat is not treating students as individuals.

6. Competency-based programs are much more expensive than conventional programs.

7. The competency-based approach might work all right for some programs, but it just won’t work in mine because...

8. Competency-based instruction is not appropriate for my area because my students need actual hands-on work.

9. It sounds good, but it just won’t work in real life, because I would need two aides, a photographer, two typists and a computer to develop and keep up with all the material and media.

10. Instructors in other occupations may be able to put their competencies down on paper, but not me, because my students need to be able to solve problems, make judgments, and do things beyond just performing basic tasks.

11. Competency-based instruction is not any different from what good instructors have been doing for years and years.

12. I don’t need this competency-based business, because my program is running smoothly right now and all of my graduates are getting jobs.

13. It looks like a good idea, but it would take a hundred years for me to sit down and identify specific competencies and write all of those learning packages.

14. The competency-based approach sounds good on the surface, but it only lowers standards so most students can pass!
15. I'm sorry, but my students just wouldn't be able to learn well from media and learning packages. They need me right there to help them and answer their questions. (pp. 16-23)

Bunda and Sanders (1979) also noted many of the above negative characteristics. They pointed out that those not in favor of competency-based programs are concerned about narrowness of focus, costs of administration, and training in the "wrong" competencies, i.e., those not actually required for performance of a specific job or task. Bunda and Sanders (1979) also note problems associated with standards development, instrument development for measuring competencies, measurement of higher level cognitive competencies, the logistics of individual competency testing, and the validation of the competencies themselves.

Austin and Titus (1988) favored PBT for technical training that is designed to correct "substandard" performance that is well-defined and for training that must yield effective results to insure safety or closely control production. They felt that performance-based training is not as effective when skill or knowledge deficiencies cannot be clearly defined as in the case of "soft" skills like supervisory skills. Kasworm (1980), also cited similar conceptual concerns about the adequacy of existing competency lists (for, in this case, determining functional literacy) and the adequacy of existing assessment techniques that may be used to measure performance related to competencies.

Lange, (1986), in discussing competency-based vocational programs, noted that instructors may fear that they will be replaced by instructors less knowledgeable than themselves--based on the assumption
that detailed learning packages would lessen the need for more expert instruction. He also noted that some instructors believed that competency-based program implementation would lessen or minimize active "teaching" and also reduce the level of skill attained by learners. Hayenga and Isaacson (1980) also echoed Kasworm's concern about the ability of program developers to adequately articulate competency and measure it. They also summarize the concern voiced by many critics that, "...the focus on so much technical and process related information will rob learning of its vitality and reduce minds from the creative to the literal" (Hayenga and Isaacson, 1980, p. 39).

Collins (1983) pointed out that a number of the above-cited negative perceptions of performance-based approaches emanate from a fear of the possible negative consequences of excessive reductionism, that is, critics fear that any attempt to explain complex phenomena (e.g. a complex occupation or job) in terms of a definitive list of precise competencies leading to effective performance is bound to fail.

Verdiun, Miller, and Greer (1977) also had voiced concerns related to reductionism. They noted that a program based on a large number of succinctly iterated competencies ran the risk of becoming a "mechanical" process (Verdiun, Miller, and Greer, 1977). They also noted that students might tend to learn isolated competencies without learning how to apply them to a given situation. Other concerns that they voiced were linked to the ideas that competency-based instruction might inhibit creativity on the part of the learner and that the approach might be "non-humanistic," resulting in lessened lack of concern for the student.
Other concerns centered around the use of precisely stated performance objectives (i.e., learning objectives stated in precise behavioral terms). Critics, (McClelland, 1973 and Skager, 1973) contend that use of such objectives is too restrictive. Ebel (1971) also notes that highly specific objectives are, "unrealistic to expect" and "impractical to use" except at very elementary levels of education.

Nitko (1989) also felt that a major deficiency of behavioral objectives is that they are not amenable to adequate diagnostic testing, since some elements of performance are necessarily left unidentified. Nitko also pointed out that a behaviorally-based objectives approach can be criticized for implying an "inappropriate theory" of how knowledge and skills are acquired -- one that views a given individual's knowledge base as a simple sum of previously learned specific behaviors.

Also of concern to many is the relative stress that is placed on products and processes. King (1979) explained that, frequently, products are more easily translatable into precise objectives, and thus may be stressed to the exclusion of less readily translatable process factors. But because "how things are done" and not just "that they are done" is frequently important, the need to consider process assessment is being more frequently recognized, as demonstrated by the many calls for new and better measuring instruments for such qualities as empathy and interpersonal communication skills.

In terms of perceived positive characteristics, Blank (1982) developed a list of comments reported by practitioners who had successfully used performance-based approaches:

- Students seem to learn more; higher scores on tests are reported.
• Students appear to remember what they learn longer; retesting over time often shows higher test scores.

• Many more students excel ... students reach higher levels of proficiency.

• Students experience success very early in the program, providing important motivation, a better feeling about the program and improved self-concept.

• More can be learned in the same length of time. Many instructors report that packaged and mediated materials eliminate much of the time students usually waste—waiting for instruction; wading through reading assignments; or receiving instruction in tasks they can already perform.

• Students learn to take more responsibility for their own learning. After some initial adjustment, most students respond well to the added responsibilities that competency-based a approach places on them.

• Instructors have more time to help students who genuinely need it. (p. 24)

Norton and Harrington (1985) also provided a synthesis of perceived benefits in the areas of management, administration, and learner outcomes:

• Students with a wide range of entering skills can be accommodated.

• Facilities and work stations can be used more fully.

• The instructional staff can be used more effectively because they have more time to work with individuals and small groups of students.

• Capital outlay funds can be used more efficiently because it is not necessary to have so many duplicate tools and equipment.

• Program continuity can be maintained even as staff members change.

• Each learner can progress through the program at his/her best rate.
• Each student can learn using his/her preferred learning style.

• More learners achieve competence that in comparable conventional training programs.

Hayenga and Isaacson (1980) also cited a number of perceived positives related to competency/performance-based approaches that support the points noted by Blank (1982), Norton (1985), and Harrington (1985). They point out that a competency-based program, "... may be the most human and serviceable solution" to the problems of trainees who learn at rates different from the average. They also cite the benefit of improved self-image or self-worth that students may receive if they are successful in this kind of program.

Zemke (1982) noted that some trainers using competency models view them as a powerful means to self-assessment (especially models based upon exemplary job performers). Verdiun, Miller, and Greer (1977) discussed the perceived strengths of competency/performance-based approaches to instruction. They contend that competency-based instructional advocates feel that its major strength is that it is learner-oriented. Learner-oriented in this case connotes a shift of focus from the teacher and the teaching process to the learner and the learning process. Other perceived strengths include increased individualization and a learning pace option.

They also point to a strong accountability that is inherent in this kind of approach--specifically stated standards of performance are an integral part. Related to accountability is the concept of immediate feedback. This too is inherent in this kind of approach--since learning objectives are clearly stated and must be achieved for program exit,
feedback on progress is an absolute necessity if corrections are to be made.

Verdiun, Miller, and Greer (1977) also noted in their discussion that competency-based materials can be very pragmatic for, and therefore, very appealing to, adult learners. This appeal is directly related to the fact that adults often need and prefer to see the applicability of learning outcomes to the "real-world" problems that confront them.

Elbow (1979) reviewed a number of issues related to the direct effects of implementation of competency-based approaches. One issue revolves around the idea that teachers must rethink what they teach when involved in a competency-based program. This is seen as valuable by some, since the instructor must consider exactly what it is that he or she wants students to know. Elbow (1979) pointed out that the nature of a competency-based program increases the likelihood of more students reaching mastery, since their achievement level is more readily identifiable than in many more conventional programs. Elbow (1979) also noted, that learners are encouraged to be less passive, taking more responsibility for their own learning.

Moore (1984) discussed the multiple purposes that competency models can serve in training programs. In programs conducted at her company, it was found that an examination of a competency profile prior to training allowed trainees to better identify their own competence levels. Moore (1984) also felt that these profiles or models permitted a better assessment by trainers of trainee learning needs.
Maginn (1978) described an early competency-based system in use at Holland College, Prince Edward Island, Canada. In his description of the school's approach he details the philosophy that underlies it. This statement of philosophy, derived in 1969, can be viewed as a set of perceptions, arrived at consensually, that described the feelings of the program originators. Selected elements of the philosophy statement follow.

- Students are responsible for their own progress, and instructors are accountable for student progress.
- Learning shall be stressed instead of teaching.
- The instructor shall assess, diagnose, prescribe, and tutor but not be the conveyor of information.
- Programs shall be individualized (personalized) to the full extent that resources allow.
- Evaluation shall be as realistic and meaningful as possible, in keeping with evaluation in the work environment.
- Ratings are based only on performance.
- Students shall evaluate their own performance prior to confirmation by an instructor.
- Students shall be able to continue their learning program in a systematic way after leaving college.

The references noted in this section are representative of the literature as a whole in terms of illustrating the recurrent reactions to or feelings about competency/performance-based approaches to instruction.
The Nature of Attitudes

Allport (1935) described a number of definitions of attitude, four of which are listed below.

1. Attitude connotes a neuropsychic state of readiness for mental and physical activity.

2. Attitudes ... preparation for readiness or response.

3. Attitude is a mental and neural state of readiness organized through experience exerting a directive or dynamic influence upon the individual’s response to all objects and situations with which it is related.

4. Attitude ... "degree of affect" for or against an object or a value. (p. 93)

Katz (1960) offered another definition of attitude:

... the predisposition of the individual to evaluate some symbol or aspect of his world in a favorable or unfavorable manner .... Attitudes include the affective, or feeling core of liking or disliking, and the cognitive, or belief, elements which describe the effect of the attitude, its characteristics, and its relation to other objects. (p. 163)

Shaw (1967) perceived the concept of attitude as a psychological variable that could be used to explain some of the consistency in human social behavior, based upon the idea that attitudes comprise a system of affective, evaluative reactions that have been learned.

Chisman (1967) noted that most psychologists would agree with Shaw’s definition, especially the evaluative component. Historically, some social psychologists would expand the concept of evaluative disposition to include an affective, cognitive, and action component Oppenheim (1966).
Since most social psychologists generally agree that attitudes involve affect and evaluative components then it follows that techniques meant to measure attitudes would generally require an individual to respond in a positive or negative manner to a social object, symbol, value, and so on.

Vecchio (1988) views attitudes as being acquired through direct experience, social communication, and emotional conditioning. Direct experience in his scheme consists of direct and personal involvement with objects in one's environment. Social communications are messages transmitted by others. Emotional conditioning is the pairing of a neutral stimulus with a positive or negative event. Vecchio contends that attitudes do affect behavior. He noted that attitudes specific in nature and formed by direct experience, particularly, seem to be important in relation to behavior.

Kreitner and Kinicki (1989) also saw attitudes as being translated into behavior via behavioral intentions. They viewed intention to engage in a given behavior as the best predictor of that behavior. In their view strength of intention is determined by both attitude and subjective norms based upon personal beliefs and motivation. Intention may be influenced more or less by each of these two affective components, depending upon their relative strength. Thus, the literature suggests (Kreitner and Kinicki, 1989; Vecchio, 1988; Ajzen and Fishbein, 1987; Steele and Ovalle, 1984; Ryan, 1982; Fazio and Zanna, 1981; Fishbein and Ajzen, 1975) that attitudes do play an
important role in behavior. Attitude may directly influence behavior. it may also influence intent to behave, a strong predictor of actual behavior.

**Attitude Measurement--**
**Scale Development**

Thurstone was one of the first psychologists to devise systematic methods for attitude measurement. His research resulted in the development of three scaling methods: paired comparisons, successive intervals, and equal-appearing intervals (Thurstone and Chane, 1929). All three of these methods may be considered as operationalizations of the law of comparative judgment which presumes that for a given stimulus and individual there exists a most frequently occurring response on a psychological continuum (its modal discriminant process). These responses are also assumed to be normally distributed about the modal response--thus providing a means for ordering a group of responses to a given stimulus.

The paired-comparisons technique proved to have a major drawback--(Scott, 1968) development became cumbersome as the number of items increased since the subject had to compare statements two at a time while determining which statement of each pair was more positive or negative. To overcome the limitations of this method Thurstone developed the successive intervals and equal-appearing intervals methods. These two methods, although improvements over the paired-comparisons method, also have limitations. For example, in the equal-appearing interval method judges are asked to evaluate statements toward an object or phenomenon in terms of the degree of favorableness or
unfavorableness of the statement. But, it has been found that judges with extremist attitudes toward the object or phenomenon do not effectively discriminate among moderate items (Scott, 1968).

These and other problems related to item judgment and assumptions about scale unidimensionality, led to the development of scaling techniques designed to overcome the limitations of the Thurstone scales. Most noteworthy among these are the Likert and Guttman scaling methods (Sax, 1979).

Likert's procedure (Likert, 1932) was designed to scale respondents, not attitude items. Systematic variation in the responses to the stimuli is attributed to differences among the respondents, and, the stimuli are considered as replications of one another. This scaling model permits very lenient assumptions about the individual parts of the scale. Since it is an additive model, no particular response need be considered individually important (McIver and Carmines, 1982). The general procedure can be briefly described as follows:

1. A set of items, consisting of an approximately equal number of favorable and unfavorable statements about an object or phenomenon is given to a group of subjects.

2. The subjects are asked to respond to each statement in terms of how much they agree or disagree with the statement (usually using a five point scale, e.g., strongly agree to, strongly disagree).

3. The responses are combined so that subjects with the most favorable attitudes will have the highest scores and subjects with the most unfavorable attitudes will have the lowest scores.
Guttman (1944) developed his scaling method (also known as scalogram analysis) in response to what he considered the shortcomings of Likert's and Thurstone's techniques. He argued that neither of their methods conclusively established that a series of items belong on a undimensional continuum. Evidence that each item is part of a single underlying dimension, he argued, is provided by a scale's ability to predict responses to all of its component items on the basis of total scores. This is, of course, contrary to the usual intent using item analysis to build a scale--where items are chosen for their ability to predict the total score.

The process of Guttman scale construction is too complex for full description here, but it was deemed unsuitable because of a number of difficulties. These major problems were summarized by Sax (1979):

1. The technique cannot be used as a means of selecting items for a questionnaire. Only after items are selected can reproducibility be judged.

2. Guttman arbitrarily establishes a reproducibility index of 0.90 as the minimum value for a scalable test (other criteria are also required). Reproducibility indexes between 0.85 and 0.90 yield what Guttman has called "quasi-scales"; indexes below 0.85 are not considered to be scalable. One difficulty is that different groups of respondents yield different reproducibility indexes.

3. The value of the reproducibility index depends on the number of subtests, items, and categories to which these subjects respond. A high index of reproducibility can occur if the number of subjects, items, and categories is small. (p. 252)

Instrument Reliability

Since the various methods for estimating the reliability of measurement instruments are well known, an extensive literature review
was not necessary. Ample sources exist that describe the appropriateness of different techniques for different purposes. What follows are summarizations of major sources in terms of the suitability of the four primary methods for estimation of instrument reliability.

The test-retest method is based upon administration of an instrument to the same group of individuals on two occasions and the consequent correlation of the paired scores. This method, being indicative of the consistency of subjects' scores over time, is considered a measure of stability (American Psychological Association, 1974). As Ary, Jacobs, and Razavieh (1979) pointed out, this method is not particularly appropriate for a number of reasons. Most importantly, this method assumes that there is no memory effect, which tends to inflate the reliability estimate.

There are also history problems with this method. The equivalent-forms (or alternate/parallel-forms) method relies upon construction and administration of two equivalent forms of the same instrument, to the same group on different occasions, with the correlating scores providing measures of both stability and equivalence (Pfeiffer and Balleu, 1988). Although powerful, providing probably the best estimate of reliability, the design of alternate forms that are truly equivalent is very difficult in practice. If forms are not truly equivalent, then the variation in scores from one form to another could not be considered as error variance, resulting in inability to determine true variance (Sax, 1979).

The split-halves method is suggested by Ebel (1971) as being a more efficient way to estimate reliability than the test-retest or
equivalent-forms methods. This method consists of a single administration of one form of a test with the items later being divided into two comparable halves. The scores obtained for each individual on the halves are used to calculate a coefficient of correlation. On the positive side, only one test is required, the history problem is eliminated, and environmental problems are minimized. A major problem with this method, however, is splitting the test into two comparable halves. Since a correlation coefficient computed between the two halves generally underestimates the reliability of the test, the Spearman-Brown prophecy formula is used to correct. But, the Spearman-Brown formula is based on the assumption that the two halves are indeed parallel. But, as Ary, Jacobs, and Razavieh (1979) noted, "this assumption is seldom correct." So, in practice, the Spearman-Brown correction formula tends to overestimate reliability compared to the test-retest or equivalent forms methods. Generally speaking, split-half reliability is appropriate only for longer instruments (Ary, Jacobs and Razavieh, 1979).

Rationale equivalence methods estimate reliability by determining how all the items on a single test relate both to all the other items, and to the whole test. The most well-known are the Chronbach Alpha and the Kuder-Richardson formulas 20 and 21. Ary, Jacobs, and Razavieh (1979) feel that the most usable of these is the Kuder-Richardson 21 (K-R 21). Use of the K-R 21 involves the least time, only a single administration, and limited information requirements. As Ary, Jacobs,
and Razavieh (1979) also pointed out, the K-R procedures focus on the equivalence of all items, and are thus particularly appropriate when an instrument is designed to measure a single trait.

**Instrument Validity**

A test is generally thought of as having validity if it measures what is supposed to measure. Some common statements related to validity are cited to illustrate:

The validity question is concerned with the extent to which an instrument measures what one thinks it is measuring (Ary, Jacobs, and Razavieh, 1979).

...the extent to which the test does in fact measure relevant criteria external to the test itself (Sax 1979).

The term validity means the accuracy with which a set of test scores measures what it ought to measure (Ebel, 1972).

In designing an attitude scale, an understanding of validity is necessary before engaging in scale construction. The literature defined four types of validity which applied to tests and measures—content validity, predictive validity, concurrent validity, and construct validity.

When discussing testing, **content validity** is generally thought to refer to the extent to which an instrument represents the content of interest in terms of the total content universe (Pfeiffer and Balleu, 1988). In the case of an instrument designed to measure attitudes, it refers to a set of distinctive behaviors representative of the total universe of behaviors indicative of the existence of a particular attitude. This type of validity is based on the judgment of "experts." As Ary, Jacobs, and Razavieh (1979:198) pointed out, "In order to obtain an external evaluation of content validity, the test maker should ask a
number of experts or other teachers to examine the test content systematically and evaluate its relevancy to the specified universe. If all agree that the test items represent the content domain adequately, the test can then be said to have content validity."

Construct validity is concerned with the extent to which a test measures a specific trait or construct" (Ary, Jacobs, and Razavieh [1979:201]). Determination of construct validity is accomplished by different means. Henerson, Morris, and Fitz-Gibbon (1978) suggested four ways of supporting the validity of attitudinal instruments:

1. Opinions of judges
2. Correlations
3. Criterion-group studies
4. Appeals to logic

Ary, Jacobs, and Razavieh (1979) also suggested that intratest analysis (determination of the degree of internal consistency) be used to gather evidence in support of construct validity. One strategy that they report involves investigation of the homogeneity of test content in order to ascertain if the test measures a single trait or quality. They noted that the Kuder-Richardson formula is useful for determining internal consistency. In terms of the importance of different types of validity in relation to attitude scales, both Callahan (1980) and Shaw (1967) suggested that construct and content validity are more important than predictive validity and concurrent validity.
Survey Research

This section provides a summary of the major concerns and issues related to the conduct of survey research. Survey research (Ary, Jacobs, Razavieh, 1979; Scheaffer, Mendenhall, Ott, 1979; Alreck and Settle, 1985) is most often employed to obtain information about variables that can be used for problem solution. It involves the collection and quantification of descriptive data rather than data collected for the purpose of hypothesis testing. Thus, survey research is of the descriptive type, designed to obtain information concerning the current status of phenomena. In this study, attitudes toward perceived performance-based training and performance-based training usage were the phenomena under study.

Sampling Design

In order to make appropriate inferences about a population from a sample of that population, it is important to consider the nature of sampling design. Many possible designs exist. The major types generally noted in the literature include random sampling, systematic sampling, stratified sampling, quota sampling, and cluster sampling. Most other types are variations of these major types.

Borg and Gall (1971); Alvin (1978); Scheaffer, Mendenhall and Ott (1979); Alreck and Settle (1985); Ary, Jacobs and Razavieh (1979); Miller (1970); and Babbie (1973) suggest a number of factors that should be considered when developing a sampling design. Reliability and validity should be of primary concern. Ideally, the design should be developed to increase both reliability and validity to as high a degree as possible. Essentially, each decision in the design process should be
viewed with an eye toward whether or not it will increase sampling error or introduce some sort of systematic bias into the data. In a general sense, true random sampling is viewed as the type that will produce the most reliable and valid results. The greater the deviation from true random selection the less one can rely on statistical inference about a given population (Schaeffer, Mendenhall and Ott, 1979).

Accurate identification of sample elements is also of importance (Alreck and Settle, 1985). The population under study, the individual units to be included in the sample, and the frame from which the units are drawn should be described with as much clarity as possible, given available information.

Sample size should be determined in light of a number of factors. These include the confidence level desired, the population variance, the data analysis techniques that will be employed, and, in a practical vein, the resources available for the study (Borg and Gall, 1971; Babbie, 1973).

**Questionnaire Development**

As Alreck and Settle (1985) note, the questions that are asked of respondents form the "core" of a survey. The questions that are addressed to the respondents have the most effect upon survey results given an otherwise well-planned and well-executed study. The basic attributes of questions (focus, brevity, clarity) should be considered when beginning construction of a questionnaire (Alreck and Settle, 1985; Henerson, Morris, Fitz-Gibbon, 1978). Questions should focus on a single issue, concern, or topic. Alreck and Settle suggest that the best way to address the issue of focus is ask oneself a question like,
"What data, exactly, needs to be obtained from answers to this question?"

Brevity of questions was another concern noted in the literature (Borg and Gall, 1971; Miller, 1970; Alreck and Settle, 1985). Short questions reduce the chance of error and simplify the response task. When questions are too long confusion is more likely. Longer questions are also more likely to lack focus and clarity.

Question clarity demands that all respondents interpret each question in the same way. Alreck and Settle (1985) suggest that, in addition to the researcher returning to questions after time intervals, one or more reviewers examine the questions for clarity, focus, and brevity.

Alreck and Settle (1985), Miller (1970) and Babbie (1973) also indicated that vocabulary and grammar should be attended to. Words used in questions should be in the vocabulary of respondents. Correct grammar is also viewed as important with simple sentences being viewed as the most effective for questions. Other major issues that they noted in relation to questions used for this study were over-demanding recall, over-emphatic wording, ambiguity of wording, leading questions and loaded questions.

Many sources of response bias related to question construction were noted in the literature (Alreck and Settle, 1985; Miller, 1970; Borg and Gall, 1971; Babbie, 1973; Alvin, 1978). These writers suggest that these sources of bias can be controlled to some degree by the wording and sequencing of questions.
Question format (structured or unstructured) was another concern noted in the literature (Miller, 1970; Henerson, Morris Fitz-Gibbon, 1978; Schuman and Presser, 1978). The comments of these writers seemed to indicate that structured questions were preferable in most circumstances.

Many questionnaire construction techniques were noted in the literature (Henerson, Morris, Fitz-Gibbon, 1978; Babbie, 1973; Miller, 1970; Borg and Gall, 1971; Sax, 1979). Concerns applicable to this study were grouping techniques, the development of instructions, and development of the demographic section. Important grouping strategies noted were:

1. The grouping of items into sections to save time, space and confusion.
2. The meaningful (to respondents) grouping of items.

In terms of instructions, clarity, brevity, and appropriateness (for the typical respondent) were points noted by Henerson, Morris, Fitz-Gibbon (1978), Babbie (1973), Miller (1970), Borg and Gall (1971), and Sax (1979). Demographic questions concerns seemed to center around clarity, brevity, degree of threat, grouping, and ease of completion. Sax (1979), Alreck and Settle (1985), and Miller (1970) noted that questions that might induce a feeling in respondents of being threatened, should be included last, to allow collection of the greatest amount of data possible (assuming the respondent would be most likely to terminate questionnaire completion when threatening questions are encountered).
Data Collection Methods

The three general methods of data collection most often noted in the literature were personal, telephone and mail. Numerous advantages and disadvantages were noted for each method (Alreck and Settle, 1985; Sax, 1979; Babbie, 1973; Miller, 1970; Borg and Gall, 1971). The factors to be considered when choosing a collection method most often included:

1. Data collection costs.
2. Time required for data collection.
3. Geographical location of respondents.
4. Possible sample size with a given budget.
5. The degree of interaction with respondents required.
6. Degree of concern about non-response bias.
7. The nature and quantity of data required.

The factor creating the most potentially serious threat to direct mail data collection (the method chosen for this study) appeared to be non-response bias. Non-return of instruments creates a situation where some groups tend to be overrepresented while others are underrepresented in a sample. Thus, the sample is biased, limiting possible generalization about the sample (Alreck and Settle, 1979).

This chapter provided a review of instructional systems, performance-based instructional systems, attitude measurement, and survey research. The next chapter provides a description of the methodology employed to conduct this study.
CHAPTER III

METHODOLOGY

To answer the research questions this study employed a number of research methods. This chapter is divided into seven sections that describe the methodology undertaken for this study: (1) research design; (2) frame selection; (3) design and development of the attitude scale; (4) sample size, validity, and reliability; (5) design and development of the questionnaire; (6) sampling and survey administration; and (7) data analysis.

Research Design

The nature of the research questions, problem, or hypothesis sets the stage for the selection of research methods and overall research design (Warmbrod, 1981). The research problem and research questions addressed by this study indicated the collection of data related to trainer attitudes and perceptions. Ary, Jacobs, and Razavieh (1979) point out that descriptive research studies are designed to obtain information about the current status of phenomena; that is, to describe what exists with respect to variables or conditions in a given situation. This descriptive study was designed to obtain information about attitudinal and perceptual phenomena that could be used to answer the research questions.
The design for this study was based upon a process model suggested by Ary, Jacobs, and Razavieh (1979). This model is briefly summarized below:

1. Clear statement of the problem identifying the variables to be studied and specification of the type of data required.
2. Identification of the data to be collected, its type (qualitative or quantitative) and its form.
3. Selection or development of instruments for collecting data.
4. Identification of the target population and determination of sampling procedures, if required.
5. Design of the procedure for collection of the data.
6. Collection of the data.
7. Analysis of the data.
8. Preparation of the report.

Descriptive data are frequently collected by the use of surveys, case studies, trend analyses, correlational studies, developmental studies, follow-up studies, and documentary analyses. These data collection methods were examined to determine which would be most suitable for this study. The research problem of the study indicated collection of data at a national level, describing trainer attitudes toward and perceived use of performance-based training in U.S. organizations. Since case studies generally involve an intensive study of one individual or single small social units (Sax, 1979), this method was deemed inappropriate. Generalizations to a larger population are very likely to lack validity.

Developmental studies are generally concerned with changes in characteristics of populations over time (Ary, Jacobs, and Razavieh,
1979). The problem of this study was primarily related to current conditions. Thus a developmental study (longitudinal or cross-sectional) was also deemed inappropriate.

Follow-up studies are most often concerned with changes in subjects after some specified treatment or condition. Once again, this study was concerned primarily with the current status of phenomena, and not with the effect of any treatment. Trend analysis was also rejected as a method for the same reason.

Documentary analysis, involving examination of records and documents, was also deemed unsuitable. As noted in chapters I and II very little accessible data exists that describes the area of practice that this study was concerned with.

Given the nature of the study problem, the survey method, which gathers limited data from a relatively large number of cases, was deemed most appropriate. The data required was relatively limited (measurement of attitudes and perceived use) and the population of interest was large (training and development/HRD practitioners in U.S. organizations). Since trainer attitudes were being investigated it was also deemed appropriate to include a correlational study component. Attitudes are seen as being acquired through direct experience, social communication and emotional conditioning. They are also seen as predictors of behavior (Vecchio, 1988; Kreitner and Kinichi, 1989; Ajzen and Fishbein, 1987). It was felt that describing the extent of relationships between variables like direct experience and trainer attitudes could provide information about variables that might affect attitudes and, consequently, the behavior of trainers.
Sax (1979) describes some of the advantages of questionnaires. They are economical. More people can be reached with questionnaires than written interviews. Guidelines offered by Alreck and Settle (1985) also cited factors that indicated use of a mailed instrument: the respondent tasks require little, if any, verbal direction or clarification. The tasks do not have to be completed in any particular location. The respondents can provide and record their own responses. The questionnaires can be dispersed over a wide geographic area. A mailed survey instrument appeared to be the most practical and logical way to obtain data for this study.

Frame Selection

One of the major problems in survey research is obtaining a suitable frame or listing of all members of a given population. The subjects of this study are individuals whose primary job responsibility is the training and development of employees within their organizations.

A search for frames that listed training and development practitioners produced only two that appear viable: the American Society for Training and Development (ASTD) directory and the membership directory of the National Society for Performance and Instruction (NSPI). The NSPI membership (approximately 5,000) is considerably smaller than the ASTD membership (approximately 25,000). ASTD membership also represents a broad cross-section of practitioners that represent many industries and types of organizations (approximately 4,500). Both directories identify members by name, employing organization, and address. Both are updated annually (and thus provide relatively current frames). The sample frame chosen for this study was

**Design and Development of the Attitude Scale**

A thorough review of the literature provided the basis for the subsequent development of the attitude scale portion of the survey instrument. A number of steps were taken to develop the attitude scale. These included defining the construct the scale would measure, accumulating positive and negative statements that reflected attitude, identifying appropriate scale items, and estimating scale reliability and validity.

**Construct Definitions**

In scale development, a detailed definition that encompasses the parameters of the psychological construct to be measured must be developed. As Henerson, Morris, and Fitz-Gibbon (1978) pointed out, a construct definition should include a list of distinctive features or characteristics that can be based on previous writing about the construct.

Multiple definitions located in the literature were examined (Elam, 1971; Blank, 1982; Norton and Harrington, 1985; Knaak, 1977; Romiszowski, 1981; Lange, 1986; Kasworm, 1980; Bunda and Sanders, 1979; Austin and Titus, 1988; Evans, 1985; Beach, 1985; Hayenga and Isaacson, 1980; Feuer, 1985; Zemke, 1985; Collins, 1983; Verdiun, Miller, and Green, 1977; McClelland, 1973; Skager, 1973; Ebel, 1971; Nitko, 1989; Elbow, 1979; Maginn, 1978). The construct description derived from these definitions is presented in Figure 8.
Critical Characteristics of Performance-Based training

1. Training is based upon competencies (the knowledge, skills, or attitudes required by a worker to perform given job tasks) that have been identified (e.g., by conducting a rigorous job/task analysis) and verified as truly being required for successful job or task performance.

2. The criteria to be used in assessing trainee achievement of the competencies are stated explicitly and known to the trainee.

3. The instructional program provides for the individual development and evaluation of each specified competency.

4. Trainees proceed at a pace most suitable for them and move forward only when they have demonstrated attainment of particular competencies.

5. Assessment of competency achievement requires actual performance of the competency.

Descriptors of Performance-Based Training Systems

1. Instructional materials are keyed to verified competencies.

2. Trainees know how, why, when, and where they will be evaluated.

3. Instructors act more as resource persons or managers of learning rather than as "teachers."

4. Instructors work more with trainees individually and in small groups than lecture in large groups.

5. There is less reliance on paper-and-pencil tests and more reliance on performance observation.

6. Trainees, as much as possible, work at their own best pace.

7. Program completion depends upon competency attainment--and performance demonstration--in a realistically simulated or actual work situation.

8. Multiple learning options are available, such as media packages, programmed instructional materials, and so on.

9. Trainees have access to learning guides that provide direction in terms of learning options.

10. Basic knowledge or background theory is learned as it is needed to support competency acquisition.

11. Trainees are given continual and detailed feedback on their progress.

12. Trainees with appropriate skills and knowledge may bypass instruction on competencies already attained.

FIGURE 8.

PERFORMANCE-BASED TRAINING CONSTRUCT DESCRIPTION
**Positive and Negative Characteristics**

As Shaw noted (1967), attitudes are reflected by learned affective and evaluative reactions that lead to behavior. Thus, measurement of attitudes requires measurement of feelings, positive or negative, that are limited to belief or knowledge about the object and create a predisposition to act. Based upon information acquired in the literature review, a decision was made to accomplish this measurement of positive or negative feelings by using the additive scaling model of Likert.

A Likert scale is constructed by first accumulating a large number of clearly favorable or unfavorable statements or reactions about the attitude to be measured (Hemerson, Morris, and Fitz-Gibbon, 1978). Hemerson, Morris, and Fitz-Gibbon suggest that potential respondents are a good source of reaction statements. The first source of positive and negative statements was a request to 15 training and development practitioners located in various areas of the U.S. (see Appendix D). By telephone they were asked to list 5 to 10 negative and positive reactions to performance-based approaches to instruction on a form that they would receive by mail. The telephone request was followed up with a reaffirmation letter, a description of a "typical" performance-based training instructional system, and the form for listing positive and negative reactions (see Appendices A, B, and C). Thirteen responses out of the 15 requests were received. Sixty-eight usable responses were generated. Examples of these positive and negative reactions are listed in Table 2.
### Positive Reactions

1. "Jobs are based on competencies, why not training?"

2. "Learning should be as accessible as possible to the trainee: If he knows precisely what is expected, he has a greater chance to meet expectations."

3. "Instructional materials should be flexible enough to accommodate individual differences."

4. "Any learning method/technique that is used in Performance-Based Training delivery can be used individually or with large groups."

### Negative Reactions

1. "This sounds terrific but I believe in having a body as a teacher/trainer."

2. "This kind of individualized training is almost cost-prohibitive with the number of employees and diverse skills we are responsible for."

3. "Some situations are impossible to simulate, i.e., encounter every customer/client situation that a representative may."

4. "Performance-Based Training is a tremendous concept but has extremely limited application unless you have a lot of $ and man-hours to spare."
The second source of characteristics was an extensive review of the literature. From this source another 27 characteristics, for a total of 95 relatively distinct positive and negative reactions, were accumulated. These reactions, which reflected favorable or unfavorable feelings, thus served as the basis for scale items.

**Scale Items**

The 95 positive and negative reactions were then written into scale statement format and presented to a jury of experts (see Appendix D) who were asked to chose 30 positive and 30 negative statements that they felt were the best distinct descriptive reactions. The jury represented training and development practitioners with experience in developing and implementing performance-based systems in manufacturing environments. According to Ary, Jacobs, and Rasavieh (1979) equal numbers of favorable and unfavorable reactions should be chosen. Henerson, Morris, and Fitz-Gibbon (1978) recommended employing approximately 60 statements. As noted earlier the additive scaling model of Likert was used. The 60 statements were therefore combined with a Likert-type 5-point strongly agree--strongly disagree scale to form a preliminary instrument (Appendix E).

Ary, Jacobs, and Razavieh (1979) and Miller (1970) recommend a pilot administration of the instrument to a respondent group for the purpose of obtaining data for item analysis. For the pilot administration, the preliminary instrument was mailed to a systematic (every kth unit) sample of 100 training and development practitioners with the concept description (Appendices B and E). Samples of the preliminary instrument items are shown in Table 3.
### TABLE 3.
SAMPLE ITEMS FROM PRELIMINARY INSTRUMENT

- PBT is useful only for low-level technical skills.
- PBT fosters self-directed learning—important to adult learners.
- PBT is an effective approach to instruction.
- PBT programs stifle instructor creativity.
- PBT can ensure that trainees reach an acceptable level of performance.
- PBT often isn’t workable, since competencies that involve things like problem-solving and decision-making can’t be put down on paper.
- PBT is useful since it allows trainee achievement to be documented.
- PBT requires too much record-keeping and documentation.
- It’s too difficult to develop appropriate learning materials for PBT.
- PBT is useful because learners can get involved by helping establish their own learning plans/goals.
- PBT is not a good approach because students learn a lot of isolated competencies that are never tied together.
Total return, after a follow-up telephone inquiry, was 57 preliminary instruments. The responses from these instruments were recorded and coded by respondent number and question number.

Two methods were employed to conduct an item analysis of the preliminary instrument. First, frequency tables of high-low scores were constructed, and second, a correlational analysis was conducted. Both of these item analyses were conducted to select from the pool of 60 preliminary instrument items the 20 items that best discriminated between high and low total scores. Henerson, Morris, and Fitz-Gibbon (1978) suggest an informal item analysis method that allows for comparisons between how respondents performed on individual items and how they scored on the instrument as a whole. This method is illustrated in Figure 9.

<table>
<thead>
<tr>
<th>Item Number</th>
<th>High Scorers</th>
<th>Low Scorers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Response Frequency</td>
<td>Response Frequency</td>
</tr>
<tr>
<td></td>
<td>SA A U D SD</td>
<td>SA A U D SD</td>
</tr>
<tr>
<td></td>
<td>5 4 3 2 1</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

**FIGURE 9.**
INFORMAL ITEM ANALYSIS
Essentially, the responses of high scorers whose scores were in the upper 25% range are graphically compared to the responses of low scorers whose scores fall in the lower 25% range. Utilization of this method failed to yield enough comparison data to discriminate effectively among more than a few items. This outcome could be due to the relatively small N (57) and a distribution of total scores with low variance and a preponderance of "positive" values. This was expected since the literature suggests that the concept of performance-based training is generally viewed as being positive.

The second method employed for item analysis was correlational. Generally, items are retained that correlate well with other items within the scale and with total scores. Since the data (scales) under consideration (total score, individual score) were ordinal, the index employed was the Spearman rho (rank) correlation coefficient (p) of the form:

\[ p = 1 - \frac{6 \sum D^2}{N(N^2-1)} \]

Where
- \( p \) = Spearman rho correlation
- \( D \) = the sum of the squares of the differences between ranks
- \( N \) = number of cases

The Spearman rho statistical index is considered most appropriate for determining relationships between two sets of rank-ordered measures (Ary, Jacobs, and Razavieh, 1979; and Warmbrod, 1981). Low scores represent a negative attitude toward performance-based training, whereas higher scores represent a more positive attitude toward the construct.
Scale values of one to five were assigned, with a value of five indicating strong agreement and a value of one indicating strong disagreement with the statement. Responses were scored according to whether they were positive or negative statements about the construct. Scale values were ascending for positive statements and descending for negative statements. Scores ranged from 80 to 281. As Henerson, Morris, and Fitz-Gibbon (1978) suggest, to discriminate effectively between high and low scores, a Spearman rho correlation was computed for each item on the preliminary instrument. These are listed in Appendix F. The coefficients were then divided into those associated with positive statements and those associated with negative statements, rank order, and the highest coefficients (indicating the greatest degree of correlation) selected for both positive and negative statements. This selection resulted in a pool of items used for the "final" instrument (Appendix G).

Sample Size, Validity and Reliability

Statistics describing the population under study are necessary to both choose appropriate sample sizes and make judgments about scale reliability and validity. Since it is generally impractical to obtain statistics based on the entire population (parameters), the generally accepted practice is to use estimators of population parameters (Scheaffer, Mendenhall, and Ott, 1979). Estimators of the population mean, standard deviation, and variance were computed.

Sample Size

Sample size choice is important since, as Snedecor and Cochran (1980) pointed out, the sample should not be so small as to make
estimates inaccurate. Also, they suggest, it should not be so large that the estimate is more accurate than required. They suggest a method for accomplishing this estimation that uses a population standard deviation estimate. To obtain the estimate of standard deviation, Alreck and Settle (1985) suggest a pilot survey for a fairly small number of respondents. This was accomplished by mailing the completed instrument to a systematic sample of the target group, ASTD national members. Fifty instruments were mailed, with a cover letter explaining the purpose of the mailing (see Appendix E). Of the 50 instruments, 22 were returned after follow-up telephone inquiries. The data provided by this mailing was used to compute an estimated population standard deviation (8.09).

The first step in the method recommended by Snedecor and Cochran is making a decision about allowable error. For this study, the commonly used error of alpha = 5% was deemed acceptable.

By setting \( L \) equal to the allowable error amount decided upon and using the estimated population standard deviation \( s \) derived from the pilot test, the formula below was used to compute an estimated sample size:

\[
 n = \frac{4s^2}{L^2}
\]

where

- \( n \) = estimated sample size
- \( s \) = estimated population standard deviation
- \( L \) = error amount

Estimated sample size was computed to be 133 units.
Reliability and Validity

A Likert summated rating scale provides relatively high reliability coefficients with 20 to 30 items (Ary, Jacobs, Razavieh, 1979). Estimation of reliability was accomplished by the use of the Kuder-Richardson formula 21:

\[
 r_{xx} = \frac{K\sigma_x^2 - \bar{x}(K-\bar{x})}{\sigma_x^2 (K-1)}
\]

Where

- \( r \) = reliability of the instrument
- \( K \) = number of items
- \( \sigma_x^2 \) = the variance of the scores
- \( \bar{x} \) = the mean of the scores

The Kuder-Richardson formula was employed to estimate reliability since it involves only one administration and is particularly appropriate when the intention of the instrument is to measure a single trait. Sax (1981) pointed out that a coefficient which approaches +1.0 means that all items are measuring the same attribute (Ary, Jacobs, Razavieh, 1979; and Sax, 1979). The KR-21 reliability coefficient for the scale was computed to be .458. Although this is not an extremely high coefficient, it is high enough to indicate that a fair degree of internal consistency exists. And, as Warmbrod (1981) noted, a coefficient of .30 to .49 indicates a "moderate" relationship. In addition as Ary, Jacobs, and Razavieh (1979) pointed out, the Kuder-Richardson reliability estimate for any given test is the mathematical equivalent of the mean of a split-half reliability estimate for the same test.
As Henerson, Morris, and Fitz-Gibbon (1978) note, construct validity can be supported in various ways. These include the opinions of judges, correlational methods, criterion-group studies, and appeals to logic.

An approach based partly upon expert opinion was employed since a literature review failed to uncover other measures of the same or related constructs, upon which the correlation method is generally based. That is, a measure of correlation between the instrument being tested and an instrument previously shown to have some degree of validity is made. The criterion group method was also discarded, since there seemed to be no practical way to locate a group of people (reference group) who could be determined to have a lack of or abundance of the attitude.

In terms of instrument validity, evidence was accumulated to support claims for construct validity and content validity. A claim for content validity can be based upon the procedures employed to acquire positive and negative reactions to performance-based training approaches. As Ary, Jacobs, and Razavieh (1979) note, content validity refers to the degree to which an instrument is representative of the content of interest, in this case, positive and negative reactions that represent, in turn, attitude toward performance-based training. To sample the universe of content, an extensive literature review was conducted to locate both positive and negative statements about or reactions to performance-based training. Reactions to a construct or concept definition of performance-based training derived from the literature were also acquired by means of a survey of practitioners.
The expert opinion data were gathered by asking three HRD practitioners to judge the instrument in terms of whether or not the attitudinal descriptors accumulated were representative of and descriptive of the construct in question (see Appendix D). These three practitioners all possessed theoretical knowledge of performance-based approaches and some measure of actual experience with development and implementation (see Appendix D). An appeal to logic also would seem to provide evidence to support validity, due to the literature review data and practitioners' responses.

**Design and Development of the Questionnaire**

A structured questionnaire was chosen as the means to gather demographic data. This decision was based on the nature of the research problem which required data related to categorized variables and two-way (yes/no) questions (Henerson, Morris, and Fitz-Gibbon, 1978). Question formats were based upon the suggestions of Borg and Gall (1971), Alreck and Settle (1985), and Sax (1979). The two basic formats considered were "unstructured" and "structured" (Alreck and Settle, 1985) or, as termed by Borg and Gall (1971), "open" and "closed." All researchers favored structured over unstructured questions. Alreck and Settle (1985) felt that unstructured questions often do not clearly indicate dimensions of response (range), often produce data that is not comparable from one group to the next, produce responses that are difficult to record, and increase required response time. Borg and Gall (1971), and Sax (1985) also made these same points and indicated that closed formats are generally much more efficient.
These data were most effectively accumulated by means of a mailed instrument; since the study was a national one, interviews were impractical. It was also considered unnecessary to obtain question elaboration.

The eight items addressing the respondents and their organization were grouped by topic, i.e., "You" and "Your Organization." As Alreck and Settle (1985) note, grouping by topic is one of the most commonly accepted criteria for grouping items. The "You" questions related to the respondents' education, experience in the training and development field, experience with performance-based training, and position within their organization. The "Your Organization" questions related to the respondents' industry, organization size, training department size, organization performance-based training activity, and organization structure. Questionnaire items were constructed that provided basic data about the respondents and their organizations, direct respondent experience with performance-based training, and the organization's use of performance-based training. The questions focused on personal and organizational variables commonly used in organizational survey work and served as a starting point for exploration into variables that might influence attitude and usage. A specific question addressing direct performance-based training experience was also included since direct experience, whether positive or negative is likely to influence attitudes (Calhoun and Acocella, 1983). The question about usage was structured in three parts to provide data about the employment of performance-based training and data that might indicate trends. These variables are listed in Table 4.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attitude toward performance-based training</td>
<td></td>
</tr>
<tr>
<td>2. Level of education</td>
<td></td>
</tr>
<tr>
<td>3. Experience in the training and development HRD field (time)</td>
<td></td>
</tr>
<tr>
<td>4. Performance-based training experience (type of)</td>
<td></td>
</tr>
<tr>
<td>5. Organizational position</td>
<td></td>
</tr>
<tr>
<td>6. Organization type</td>
<td></td>
</tr>
<tr>
<td>7. Organization size</td>
<td></td>
</tr>
<tr>
<td>8. Training department size</td>
<td></td>
</tr>
<tr>
<td>9. Organization current usage of PBT systems</td>
<td></td>
</tr>
<tr>
<td>10. Organization usage of PBT approaches to instructional design</td>
<td></td>
</tr>
<tr>
<td>11. Organization past usage of PBT systems</td>
<td></td>
</tr>
</tbody>
</table>

Field Test

Henerson, Morris, and Fitz-Gibbon (1978) and Miller (1970) suggest a field test or tryout of an instrument to avoid distributing an instrument with undetected flaws. A field test was conducted by asking four practitioners familiar with survey work (Appendix D) to complete the instrument and comment upon question clarity, instruction clarity, concept description adequacy, format, and demographic category "all-inclusiveness"/"mutual-exclusiveness." Adjustments were then made to the instrument. Some categories were condensed (ranges changed) and the directions modified.
Sampling and Survey Administration

As Alreck and Settle (1985) note, "nth" or "kth" name sampling is the most commonly used method of selecting a systematic sample when the sample frame consists of a list of sample units.

Sax (1979) also commented on systematic sampling:

There are a number of important advantages in using a systematic rather than a simple random sample. In the first place, there is usually a considerable saving of work. Wherever population elements are listed (such as rosters, rolls, etc.), use of a table of random numbers is unnecessary, and the sample can be chosen by simply selecting every nth case. This procedure may also be of advantage in selecting cases with strata as long as the elements are listed in some form. Systematic sampling also gives assurance that there is broad sampling throughout the population. It may, therefore, provide a more accurate sample. (p. 91)

The only major source of sampling error noted by Sax in conducting systematic sampling is the problem of recurring patterns that might increase or decrease the chances of a unit being included in the sample. This did not appear to be a concern with this particular frame, since no apparent patterns could be identified.

As noted earlier, the population for this study was determined to be members of the American Society for Training and Development listed in the 1989 membership directory. This directory provided population parameters and the list. Every 125th (kth) unit was selected from this document to provide a sample of 200 units with the starting point picked randomly from the first page of the directory (Alreck and Settle, 1985). Alreck and Settle (1985) point out that, for a population of 10,000 or more, 200 to 1,000 sampling units are considered the norm among most researchers in terms of practical sample size. A sample size of less
than 200 may not provide enough usable data, while a sample size larger than 1,000 may provide too much data to reasonably analyze.

Several factors indicated a small rather than large sample for this study (Alrech and Settle, 1985). First, since the study was exploratory, no decisions would be based on the data. Second, descriptive statistics computed for preliminary instrument respondents indicated little variance in the population. Third, the study plan called for analysis and interpretation to be based upon the entire sample. Fourth, budget constraints were a limiting factor.

After the sample list was drawn, a mailing, which included the final instrument and a return envelope, was assembled and mailed to sample members. The first page of the final instrument contained a letter that indicated the nature of the study, directions, and a request for help. The second page contained the concept description, the third the attitude scale, and the fourth contained the questionnaire. Each instrument was coded with a number that identified each sample member. This was done to maintain a record of response.

As the respondents returned instruments the sample list was annotated. Sixty-three instruments were returned. After a 10-day allowance for return, a follow-up mailing was conducted to increase the return rate. An additional 12 instruments were returned after the follow-up mailing. A total of 75 instruments (37.5%) were returned. This mailing included a "second request" note asking for help with the study (Appendix H).

After all returns were collected, each was coded with a respondent number in preparation for the data analysis portion of the study.
Non-Respondent Data

To help address the threat of non-response bias, a mailing of 50 instruments was conducted to obtain data about non-respondents. Eleven instruments were returned. Appendix I contains the request letter that accompanied the instrument. The 50 non-respondents chosen were drawn randomly from the non-respondent/non-accounted-for group from the original sample. The returned instruments were processed in the same manner as those returned in the original mailing.

Statistical tests were applied to compare the respondent and non-respondent groups. Comparison data related to these two groups provided information about the possible effects of non-response bias on the study results.

Chi-square tests were conducted to gather evidence about whether or not differences between expected and observed frequencies of responses were statistically significant. The variables that were examined and the chi-square values computed are listed in Table 5. At a significance level of .05 differences were not statistically significant. That is, the two groups appear not to significantly differ on the variables tested.
To further gather comparative evidence about the two groups, a t-test for independent samples was conducted to compare mean attitude scale score responses. The t-ratio value at a significance level of .05 did not exceed the critical value, indicating that the mean responses of the two groups were not significantly different. T-test data is displayed in Table 6. Since both statistical tests indicated that there was no significant difference between the two groups, the threat of non-response bias appears to be minimal.

### TABLE 5.
**CHI-SQUARE TEST VALUES FOR SELECTED VARIABLES**

<table>
<thead>
<tr>
<th>Variable</th>
<th>X</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Level</td>
<td>.94</td>
<td>4</td>
</tr>
<tr>
<td>Experience in the Training and Development/HRD Field</td>
<td>6.91</td>
<td>3</td>
</tr>
<tr>
<td>Experience with Performance-Based Training</td>
<td>.15</td>
<td>1</td>
</tr>
<tr>
<td>Organizational Position</td>
<td>1.04</td>
<td>3</td>
</tr>
<tr>
<td>Organization Size</td>
<td>3.58</td>
<td>4</td>
</tr>
</tbody>
</table>
TABLE 6.
T-TEST DATA, NON-RESPONDENT--RESPONDENT GROUPS

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error of the Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-respondents</td>
<td>11</td>
<td>78.55</td>
<td>8.30</td>
<td>2.5</td>
</tr>
<tr>
<td>Respondents</td>
<td>75</td>
<td>77.77</td>
<td>9.12</td>
<td>1.1</td>
</tr>
</tbody>
</table>

CI = .95        P = .78

\[ t = 0.28 \] \quad \text{df} = 14.0

Data Analysis

This study was designed to provide baseline data about training and development practitioner attitudes toward performance-based training. It was also designed to provide baseline data about the perceived usage of performance-based training approaches in U.S. organizations. In addition, relationships between selected variables employed in the questionnaire and attitude scores were examined. The data analysis was carried out using the Minitab Data Analysis Software, available through The Ohio State University Instruction Research Computer Center and the Clark State Community College Computing Center, Springfield, Ohio.

Descriptive statistics involve describing and summarizing the properties of a collection of data (Warmbrod, 1981). The respondent group was described by means of attitude scale scores and score distribution characteristics. Scores were derived from the first part of the survey instrument. The group was also described by frequencies
and percentages of responses from the questionnaire portion of the instrument. Perceived employment of performance-based training approaches was also analyzed by frequencies and percentages of responses to questionnaire items.

A frequently used descriptive statistic is a measure of relationship (association) between variables. The magnitude or degree of relationship is described by a correlation coefficient chosen according to the scales of measurement (nominal, ordinal, interval, or ratio) of the variables of interest (Hopkins and Glass, 1978). Selected variables used in the questionnaire portion of the instrument and attitude scale scores were examined to identify relationships. The Spearman Rho rank-correlation coefficient was the measure employed since it is a generally considered most appropriate for use with ordinal measures (Warmbrod, 1981).

This chapter provided a description of the methodology employed to conduct this study. This description included the research design, selection of the sample frame, design and development of the attitude scale, and a discussion of sample size, validity and reliability. It also included a discussion of the design and development of the questionnaire, sampling procedures and survey administration, and an overview of the data analysis. The next chapter provides a discussion of the results and findings of the data analysis.
CHAPTER IV
ANALYSIS OF DATA AND FINDINGS

Introduction

The purpose of this chapter is to present the analysis of the study data and findings. Additional data and examples of instrumentation and other documents used in the study are provided for reference and further clarification in the Appendices.

The first main purpose of this study was to examine the attitudes of training and development/HRD practitioners toward the construct, performance-based training. The second purpose was to investigate the use of performance-based training.

The first section of this chapter provides a description of the respondents. They are described by attitude scale responses and by frequency/percentage of response tables based on the questionnaire demographic items. Response frequency data are also displayed by means of bar charts. The second section of this chapter provides an analysis of reported employment of performance-based training approaches. These data are presented by frequency/percentage of response tables and bar charts. The last section contains an analysis and discussion of relationships between attitudes toward performance-based training and selected variables. Data is presented in a correlation table.
Description of Respondents

Sample Data

This section provides a description of the survey respondents. Included are the description of sample data, attitude scale data, and data related to the first seven questionnaire items. The sample used in the study was drawn from Who's Who in Training and Development, the 1989 official membership directory of the American Society for Training and Development (ASTD). Table 7 describes the sampling outcomes. Table 8 portrays frequency and percent of respondents by state. Figure 10 provides a graphic display of response frequency by state. As the data in Table 8 and Figure 10 indicate the sample was distributed across 37 states or about 75% of all states. The greatest number of responses were from Florida, Illinois, Ohio, Pennsylvania, and Virginia.

<table>
<thead>
<tr>
<th>Sample Data</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usable Returns</td>
<td>75</td>
<td>37.5</td>
</tr>
<tr>
<td>Unusable Returns</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Returned as Undeliverable</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Not Returned</td>
<td>117</td>
<td>59.5</td>
</tr>
<tr>
<td>Total Sample Size</td>
<td>200</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The minimum sample size for a statistical 5% error allowance, as noted in Chapter III, was 133 units, with a sample of 200 chosen as the minimum practical sample size. Table 7 indicates that 37.5% of the
returns were usable, 2.0% were unusable, and 2.0% were returned. A little less than half of the sample, or 41.5% was accounted for by the initial mailing. Returns were considered usable if the entire instrument was completed. Returns considered unusable were those only partially completed.

The return rate for the survey (37.5%), although low in terms of the threat of non-response bias, is not unusual. Alreck and Settle (1985) note that it is rare for the return rate of mail surveys to exceed 30%. The analysis of non-respondents and respondents described in Chapter III suggests that the respondent group did not differ significantly from the non-respondent group. These results serve to decrease the threat of non-response bias.
### Table 8.

**Distribution of Respondents by State**

<table>
<thead>
<tr>
<th>State</th>
<th>N</th>
<th>%</th>
<th>State</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>1</td>
<td>1.3</td>
<td>Montana</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Alaska</td>
<td>0</td>
<td>0.0</td>
<td>Nebraska</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Arizona</td>
<td>2</td>
<td>3.0</td>
<td>Nevada</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Arkansas</td>
<td>0</td>
<td>0.0</td>
<td>New Hampshire</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>California</td>
<td>3</td>
<td>4.0</td>
<td>New Jersey</td>
<td>3</td>
<td>4.0</td>
</tr>
<tr>
<td>Colorado</td>
<td>0</td>
<td>0.0</td>
<td>New Mexico</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Connecticut</td>
<td>1</td>
<td>1.3</td>
<td>New York</td>
<td>3</td>
<td>4.0</td>
</tr>
<tr>
<td>Delaware</td>
<td>1</td>
<td>1.3</td>
<td>North Carolina</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Florida</td>
<td>4</td>
<td>5.0</td>
<td>North Dakota</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>Georgia</td>
<td>2</td>
<td>3.0</td>
<td>Ohio</td>
<td>5</td>
<td>7.0</td>
</tr>
<tr>
<td>Hawaii</td>
<td>1</td>
<td>1.3</td>
<td>Oklahoma</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>Idaho</td>
<td>0</td>
<td>0.0</td>
<td>Oregon</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Illinois</td>
<td>4</td>
<td>5.0</td>
<td>Pennsylvania</td>
<td>5</td>
<td>7.0</td>
</tr>
<tr>
<td>Indiana</td>
<td>2</td>
<td>3.0</td>
<td>Rhode Island</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Iowa</td>
<td>3</td>
<td>4.0</td>
<td>South Carolina</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Kansas</td>
<td>1</td>
<td>1.3</td>
<td>South Dakota</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Kentucky</td>
<td>3</td>
<td>4.0</td>
<td>Tennessee</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Louisiana</td>
<td>1</td>
<td>1.3</td>
<td>Texas</td>
<td>3</td>
<td>4.0</td>
</tr>
<tr>
<td>Maine</td>
<td>0</td>
<td>0.0</td>
<td>Utah</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Maryland</td>
<td>2</td>
<td>3.0</td>
<td>Vermont</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>1</td>
<td>1.3</td>
<td>Virginia</td>
<td>4</td>
<td>5.0</td>
</tr>
<tr>
<td>Michigan</td>
<td>2</td>
<td>3.0</td>
<td>Washington</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Minnesota</td>
<td>1</td>
<td>1.3</td>
<td>West Virginia</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Mississippi</td>
<td>1</td>
<td>1.3</td>
<td>Wisconsin</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>Missouri</td>
<td>1</td>
<td>1.3</td>
<td>Wyoming</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Washington, DC</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>37</td>
<td>50.0</td>
<td></td>
<td>38</td>
<td>50.3</td>
</tr>
</tbody>
</table>
FIGURE 10.
DISTRIBUTION OF RESPONDENTS BY STATE
Non-response may also be affected by the relative complexity of the survey instrument. To minimize this threat, the response task was designed to be as simple as possible while still allowing for the collection of the required data.

**Attitude**

Descriptive statistics for the attitude scale scores are listed in Table 9. These include measures of central tendency, variability, and symmetry. The relationship of the mean and median indicates a very slightly negatively skewed distribution of scores. This skewedness may be accounted for by a few negative values. These are evidenced by the range of scores (53 to 96) and the quartile derivations. The range indicates some negative values, whereas the quartile derivations indicate a generally narrow spread of scores. The scale was constructed to have a mid-point value of 60 and a range of values from 20 to 100, with values above the mid-point viewed as "positive" and values below the mid-point viewed as "negative."
The standard deviation also indicates low score variability. This is further evidenced by the histogram of scale scores (Figure 11).

**TABLE 9.**
**DESCRIPTIVE STATISTICS FOR ATTITUDE SCALE SCORES**  
(N=75)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>77.77</td>
</tr>
<tr>
<td>Mode</td>
<td>76.00</td>
</tr>
<tr>
<td>Median</td>
<td>78.00</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>9.12</td>
</tr>
<tr>
<td>Standard Error of the Mean</td>
<td>1.05</td>
</tr>
<tr>
<td>Range</td>
<td>53.00 - 96.00</td>
</tr>
<tr>
<td>Q1, Lower Quartile Deviation</td>
<td>72.00</td>
</tr>
<tr>
<td>Q3, Upper Quartile Deviation</td>
<td>82.00</td>
</tr>
</tbody>
</table>

**FIGURE 11.**
**HISTOGRAM OF ATTITUDE SCALE SCORES**
Low score variability may be a function of scale characteristics. Item construction, the number of items, and the number of scale values for items are factors that are likely to affect variability (Sax, 1979).

Level of Education

As shown in Table 10, the variable level of education was divided into five categories: no college degree, bachelor’s degree, bachelor’s degree plus some graduate work, master’s degree, and doctoral degree. As the data indicate, 71 respondents, or 94.6%, had postsecondary degrees. Forty-eight respondents, or 64.0%, possessed master’s degrees or greater. Almost half (49.3%) of all respondents held master’s degrees. The respondent group as a whole, then, held educational credentials significantly greater than most of the U.S. population.

<table>
<thead>
<tr>
<th>Education Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No college degree</td>
<td>4</td>
<td>5.3</td>
</tr>
<tr>
<td>2. Bachelor’s degree</td>
<td>8</td>
<td>10.6</td>
</tr>
<tr>
<td>3. Bachelor’s degree plus some</td>
<td></td>
<td></td>
</tr>
<tr>
<td>graduate work</td>
<td>15</td>
<td>20.0</td>
</tr>
<tr>
<td>4. Master’s degree</td>
<td>37</td>
<td>49.3</td>
</tr>
<tr>
<td>5. Doctoral degree</td>
<td>11</td>
<td>14.7</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>100.0</td>
</tr>
</tbody>
</table>
The fact that four respondents, or 5.3% of the sample, held no degree was expected by this researcher. Experience in the field has shown that manufacturing sector training and development practitioners are more likely to be non-degreed than practitioners in other industries. This is supported somewhat by the data in Table 11 depicting educational level by industry type. Three of the four respondents reporting no degree were from the manufacturing sector. Interestingly one of the two most educated groups (reported master’s and doctoral degrees) was also manufacturing (the other being utilities). This raises a question. Does the manufacturing sector contain a mix of practitioners who are less formally educated and also highly educated? Perhaps educational levels vary by type of manufacturing (for example, light industry versus heavy industry).
TABLE 11.
EDUCATIONAL LEVEL BY INDUSTRY TYPE

<table>
<thead>
<tr>
<th>Industry Type</th>
<th>No Degree N</th>
<th>No Degree %</th>
<th>Bachelor's N</th>
<th>Bachelor's %</th>
<th>Bachelor's+ N</th>
<th>Bachelor's+ %</th>
<th>Master's N</th>
<th>Master's %</th>
<th>Doctoral N</th>
<th>Doctoral %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>3</td>
<td>4.0</td>
<td>1</td>
<td>1.3</td>
<td>1</td>
<td>1.3</td>
<td>10</td>
<td>13.3</td>
<td>4</td>
<td>5.3</td>
</tr>
<tr>
<td>Transportation/</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>2</td>
<td>2.7</td>
<td>3</td>
<td>4.0</td>
<td>2</td>
<td>2.7</td>
</tr>
<tr>
<td>Communications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Services</td>
<td>1</td>
<td>1.3</td>
<td>1</td>
<td>1.3</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Wholesale/Retail</td>
<td>0</td>
<td>0.0</td>
<td>3</td>
<td>4.0</td>
<td>1</td>
<td>1.3</td>
<td>2</td>
<td>2.7</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Trade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Administration</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>1.3</td>
<td>2</td>
<td>2.7</td>
<td>5</td>
<td>6.6</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Finance/Insurance/</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>5</td>
<td>6.6</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Banking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utilities</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>1.3</td>
<td>4</td>
<td>5.3</td>
<td>5</td>
<td>6.6</td>
<td>2</td>
<td>2.7</td>
</tr>
<tr>
<td>Business Services</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>3</td>
<td>4.0</td>
<td>3</td>
<td>4.0</td>
<td>2</td>
<td>2.7</td>
</tr>
<tr>
<td>Health Services</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>1.3</td>
<td>0</td>
<td>0.0</td>
<td>4</td>
<td>5.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>2</td>
<td>2.7</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Totals</td>
<td>4</td>
<td>5.3</td>
<td>8</td>
<td>9.2</td>
<td>15</td>
<td>20.0</td>
<td>37</td>
<td>49.1</td>
<td>11</td>
<td>14.7</td>
</tr>
</tbody>
</table>
Figure 12 graphically displays education levels reported by respondents.

![Bar Chart](chart.png)

**FIGURE 12. LEVEL OF EDUCATION**

**Training and Development Experience**

The length of experience of respondents in the training and development/HRD field is depicted in Table 12. As noted, 65 (86.6%) of the respondents possessed four or more years' experience in the field. A substantial percentage (41.3%) had 10 or more years' experience. Only 10 respondents (13.3%) had three years or less experience. Figure 13 illustrates graphically the experience levels of the respondents.
### TABLE 12.
LENGTH OF EXPERIENCE IN THE TRAINING AND DEVELOPMENT/HRD FIELD

<table>
<thead>
<tr>
<th>Experience Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Under 1 year</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>2. 1 to 3 years</td>
<td>9</td>
<td>12.0</td>
</tr>
<tr>
<td>3. 4 to 10 years</td>
<td>34</td>
<td>45.3</td>
</tr>
<tr>
<td>4. Over 10 years</td>
<td>31</td>
<td>41.3</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>99.9</td>
</tr>
</tbody>
</table>

* Percents may total less than 100 due to rounding.

#### FIGURE 13.
LENGTH OF EXPERIENCE IN THE TRAINING AND DEVELOPMENT FIELD
Performance-Based Training Experience

As noted previously in Chapter II, experience is an important determinant of the strength of attitude. Data gathered via the questionnaire item related to the variable experience with performance-based training was analyzed in two different ways in terms of respondents' experiences with performance-based training. Table 13 shows that a large percentage of practitioners have had experience with performance-based training approaches (77.3%). Only 17 (22.7%) reported no experience with performance-based training.

TABLE 13.

<table>
<thead>
<tr>
<th>Experience Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Experience with PBT</td>
<td>58</td>
<td>77.3</td>
</tr>
<tr>
<td>2. No experience with PBT</td>
<td>17</td>
<td>22.7</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 14 depicts length of experience in the field by experience with performance-based training. The data suggests that experience with PBT is not related to experience in the field. Respondents reporting experience with PBT were relatively evenly distributed through the experience categories in terms of percentages of yes/no responses by category.
**TABLE 14.**

LENGTH OF EXPERIENCE IN THE TRAINING AND DEVELOPMENT/HRD FIELD
VERSUS EXPERIENCE/NO EXPERIENCE WITH
PERFORMANCE-BASED TRAINING

<table>
<thead>
<tr>
<th>Experience Category</th>
<th>Y</th>
<th>%</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Under 1 year</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>2. 1 to 3 years</td>
<td>8</td>
<td>10.5</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>3. 4 to 10 years</td>
<td>27</td>
<td>36.0</td>
<td>7</td>
<td>9.3</td>
</tr>
<tr>
<td>4. Over 10 years</td>
<td>23</td>
<td>30.7</td>
<td>8</td>
<td>10.7</td>
</tr>
<tr>
<td>TOTALS</td>
<td>58</td>
<td>77.2</td>
<td>17</td>
<td>22.6</td>
</tr>
</tbody>
</table>

The second analysis was based on four categories of experience likely to be encountered by the typical practitioner: program participant/learner, program developer/designer, educational experience, and observation without direct involvement. These categories in questionnaire statement form and a summary of the responses are shown in Table 15.
### TABLE 15.

PERFORMANCE-BASED TRAINING EXPERIENCE

<table>
<thead>
<tr>
<th>Experience Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A participant/learner</td>
<td>29</td>
<td>38.7</td>
</tr>
<tr>
<td>2. A developer/designer of PBT programs</td>
<td>41</td>
<td>54.7</td>
</tr>
<tr>
<td>3. A learner within an educational institution</td>
<td>15</td>
<td>20.0</td>
</tr>
<tr>
<td>4. An observer (e.g., it was used elsewhere in my organization)</td>
<td>11</td>
<td>14.7</td>
</tr>
<tr>
<td>5. I have no direct experience with PBT</td>
<td>17</td>
<td>22.7</td>
</tr>
<tr>
<td>Total</td>
<td>113</td>
<td>150.8</td>
</tr>
</tbody>
</table>

* Percents total more than 100 due to multiple types of experience of respondents.

It is noteworthy that a number of the respondents reported several different types of PBT experiences. A total of 70 direct involvements with actual programs (categories 1 and 2) were reported. Only 15 reports of educational experience were noted. If organizational observation reports were included in the direct involvement category, then 81 out of the total 113 (71.7%) performance-based training experiences were with actual programs or instructional systems rather than purely educational experiences. Figure 14 illustrates graphically the results of the four experience categories discussed above.
**Organizational Position**

As might be expected, given the length of experience of the respondents, a notable percentage (54.7) were classified as function managers (Table 16). Length of experience is logically positively related to the likelihood of holding a management position. In the training and development/HRD field, a management position may also be more likely since functional areas concerned with employee training and development are generally small in terms of the number of personnel assigned. Thus, if an individual is a practitioner, the likelihood of holding a management position is higher than that in many other functional areas (e.g., accounting, plant operations, engineering,
etc.). Thirty-four, or 45.3% of the respondents, placed themselves in categories other than managerial in terms of the organizational position variable. Figure 15 provides a graphic display of managerial versus nonmanagerial organizational positions.

**TABLE 16. RESPONDENT ORGANIZATIONAL POSITION**

<table>
<thead>
<tr>
<th>Position Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. HRD Manager A:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other training/HRD managers report to me</td>
<td>11</td>
<td>14.7</td>
</tr>
<tr>
<td>2. HRD Manager B:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manager of a training/HRD functional area with professional direct reports</td>
<td>30</td>
<td>40.0</td>
</tr>
<tr>
<td>3. HRD Specialist:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructor, instructional designer, organization development, or management development</td>
<td>28</td>
<td>37.3</td>
</tr>
<tr>
<td>4. Other:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personnel manager, personnel specialist, other line or staff functions</td>
<td>6</td>
<td>8.0</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 17 provides a description of organizational position reports versus educational level reports. Overall, the data suggests that all managers (HRD Manager A and HRD Manager B categories) are more highly educated than other HRD specialists. In terms of the HRD Manager A category (other training/HRD managers report to the position) 75% of respondents reported holding either a master's or doctoral degree.
### TABLE 17.
RESPONDENT ORGANIZATIONAL POSITION VERSUS EDUCATIONAL LEVEL

<table>
<thead>
<tr>
<th>Position Category</th>
<th>No Degree</th>
<th>Bachelor's</th>
<th>Bachelor's+</th>
<th>Master's</th>
<th>Doctoral</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>1. HRD Manager A: other training/HRD Managers report to me</td>
<td></td>
<td></td>
<td>1</td>
<td>1.3</td>
<td>1</td>
</tr>
<tr>
<td>2. HRD Manager B: Manager of a training/HRD functional area with professional direct reports</td>
<td>1</td>
<td>1.3</td>
<td>2</td>
<td>2.7</td>
<td>6</td>
</tr>
<tr>
<td>3. HRD Specialist: Instructor, instructional designer, organization development, or management development</td>
<td>2</td>
<td>2.7</td>
<td>4</td>
<td>5.3</td>
<td>5</td>
</tr>
<tr>
<td>4. Other: Personnel manager, personnel specialist, other line or staff functions</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>1.3</td>
<td>3</td>
</tr>
</tbody>
</table>

**TOTALS** 4 5.3 8 10.6 15 20.0 37 49.4 11 14.6
Industry Types

Table 18 provides a summary of the types of industries employing the respondents. A relatively large percentage reported being employed in either manufacturing (25.3%) or the utilities (16.0%) industries. The other industrial categories were relatively evenly distributed except for "Educational Services" and "Other" (mining, construction, agricultural, etc.), each of which had two respondents. Figure 16 provides a graphic illustration of the types of industries.

Table 18.
TYPE OF INDUSTRY OF RESPONDENT

<table>
<thead>
<tr>
<th>Industry Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Manufacturing</td>
<td>19</td>
<td>25.3</td>
</tr>
<tr>
<td>2. Health Services</td>
<td>5</td>
<td>6.7</td>
</tr>
<tr>
<td>3. Transportation/Communication</td>
<td>7</td>
<td>9.3</td>
</tr>
<tr>
<td>4. Educational Services</td>
<td>2</td>
<td>2.6</td>
</tr>
<tr>
<td>5. Wholesale/Retail Trade</td>
<td>6</td>
<td>8.0</td>
</tr>
<tr>
<td>6. Public Administration</td>
<td>8</td>
<td>10.7</td>
</tr>
<tr>
<td>7. Finance/Insurance/Banking</td>
<td>6</td>
<td>8.0</td>
</tr>
<tr>
<td>8. Utilities</td>
<td>12</td>
<td>16.0</td>
</tr>
<tr>
<td>9. Business Services</td>
<td>8</td>
<td>10.7</td>
</tr>
<tr>
<td>10. Other (Mining, Construction,</td>
<td>2</td>
<td>2.6</td>
</tr>
<tr>
<td>Agriculture, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>99.9</td>
</tr>
</tbody>
</table>

* Percents may total less than 100 due to rounding.
FIGURE 16.
TYPE OF INDUSTRY OF RESPONDENT
Organization Size

As shown in Table 19 a relatively large percentage of organizations (32.0%) reported 2,500 or more employees. Nearly two-thirds of the responses indicated an organization of 500 or more employees. Five hundred is often the breaking point (although arbitrary) in organizational survey work and demographic studies of "large" and "small" organizations. If this breaking point is accepted, then approximately two-thirds of the respondents' organizations could be considered "large," whereas approximately one-third could be considered "small." Figure 17 provides displays this breakdown graphically. This relationship raises some questions. Are training and development/HRD practitioners employed by larger organizations more likely to belong to ASTD? Are they more likely to respond to surveys?

<table>
<thead>
<tr>
<th>Size Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Under 100</td>
<td>12</td>
<td>16.0</td>
</tr>
<tr>
<td>2. 100 to 499</td>
<td>14</td>
<td>18.7</td>
</tr>
<tr>
<td>3. 500 to 2,499</td>
<td>25</td>
<td>33.3</td>
</tr>
<tr>
<td>4. 2,500 or more</td>
<td>24</td>
<td>32.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>75</td>
<td>100.0</td>
</tr>
</tbody>
</table>

TABLE 19.
RESPONDENT ORGANIZATION SIZE
Training Department Size

In terms of training department size, the two largest categories reported (Table 20) were 1 to 5 employees (36.0%) and 20 or more employees (21.3%). Smaller departments (five employees and under) accounted for 56.0% of responses, whereas larger departments (six or more employees) accounted for the remainder. Department sizes are illustrated in Figure 18.
### TABLE 20.
RESPONDENT TRAINING DEPARTMENT SIZE

<table>
<thead>
<tr>
<th>Size Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. None, no distinct function</td>
<td>4</td>
<td>5.3</td>
</tr>
<tr>
<td>2. One</td>
<td>11</td>
<td>14.7</td>
</tr>
<tr>
<td>3. 1 to 5</td>
<td>27</td>
<td>36.0</td>
</tr>
<tr>
<td>4. 6 to 10</td>
<td>8</td>
<td>10.7</td>
</tr>
<tr>
<td>5. 11 to 20</td>
<td>9</td>
<td>12.0</td>
</tr>
<tr>
<td>6. 20 or more</td>
<td>16</td>
<td>21.3</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>100.0</td>
</tr>
</tbody>
</table>

### FIGURE 18.
TRAINING DEPARTMENT SIZE
Employment of Performance-Based Training Approaches

As noted in Chapter II, very little accessible data exist about the nature and extent of employment of performance-based training approaches within U.S. business and industry. This section provides an analysis of the data derived from three questions included in the "performance-based training activity" variable:

1. Is your organization currently employing PBT approaches?
2. Does your organization utilize PBT approaches to instructional design?
3. Has your organization used PBT approaches in the past?

These three questions were chosen to provide data to answer the research question related to the usage of performance-based training approaches and the relationships between selected variables. In this section the variables examined were as follows:

1. Organization type
2. Organization size
3. Training department size

Questions 1 and 3 were framed to obtain data about current and past usage. Question 2 was framed to gather data about the instructional design strategies and techniques employed in business and industry. This question was deemed appropriate, since information collected by experience in the field and review of the literature indicated that organizations may employ selected elements of a performance-based approach (as noted in Chapter II) based upon the availability of resources. That is, a fully formed performance-based
instructional system may be the goal or ideal aimed for by departments that must work within organizational limitations.

The three variables noted above are those likely to relate directly to usage in a practical sense, since experience and the literature pointed to available resources (whether perceived or actual) as being a key factor in using performance-based training approaches. The availability of resources can be most clearly linked to training department size and organization size. As noted in Chapter II, there also appears to be a tendency for performance-based training approaches to be employed to a greater extent within the manufacturing and utilities industries.

Table 21 provides a summary of responses by all respondents to the three usage questions. As noted in the table, responses to each of the questions are relatively equally divided between "yes" and "no" responses. The fewest "yes" responses were made to the past use question, while the largest response was to the design question.
TABLE 21.
ORGANIZATION PERFORMANCE-BASED TRAINING ACTIVITY

<table>
<thead>
<tr>
<th>Usage Category</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
<th>None</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is your organization currently employing PBT approaches?</td>
<td>38</td>
<td>50.7</td>
<td>34</td>
<td>45.5</td>
<td>3</td>
<td>4.0</td>
</tr>
<tr>
<td>2. Does your organization utilize PBT approaches to instructional design?</td>
<td>41</td>
<td>54.7</td>
<td>32</td>
<td>42.7</td>
<td>2</td>
<td>2.7</td>
</tr>
<tr>
<td>3. Has your organization used PBT approaches in the past?</td>
<td>33</td>
<td>44.0</td>
<td>40</td>
<td>53.3</td>
<td>2</td>
<td>2.7</td>
</tr>
</tbody>
</table>

Tables 22, provides a summary of responses by organization type to the current use question. Manufacturing and utilities respondents reported the most instances of current use. Finance/Insurance/Banking and Wholesale/Retail/Trade reported the fewest instances of current use.
TABLE 22.
ORGANIZATION TYPE AND EMPLOYMENT OF PERFORMANCE-BASED TRAINING APPROACHES

<table>
<thead>
<tr>
<th>Organization Type</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
<th>None</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question: Is your organization currently employing PBT approaches?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Manufacturing</td>
<td>14</td>
<td>18.7</td>
<td>4</td>
<td>5.3</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>2. Health Services</td>
<td>1</td>
<td>1.3</td>
<td>3</td>
<td>4.0</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>3. Transportation/Communication</td>
<td>2</td>
<td>2.7</td>
<td>5</td>
<td>6.7</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>4. Educational Services</td>
<td>2</td>
<td>2.7</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>5. Wholesale/Retail Trade</td>
<td>0</td>
<td>0.0</td>
<td>6</td>
<td>8.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>6. Public Administration</td>
<td>4</td>
<td>5.3</td>
<td>4</td>
<td>5.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>7. Finance/Insurance/</td>
<td>1</td>
<td>1.3</td>
<td>5</td>
<td>6.7</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Banking</td>
<td>1</td>
<td>1.3</td>
<td>5</td>
<td>6.7</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>8. Utilities</td>
<td>7</td>
<td>9.3</td>
<td>5</td>
<td>6.7</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>9. Business Services</td>
<td>5</td>
<td>6.7</td>
<td>2</td>
<td>2.7</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>10. Other (Mining, Construction, Agriculture, etc.)</td>
<td>2</td>
<td>2.7</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Tables 23 and 24 provide summaries of responses by organization type and the instructional design and past use questions, respectively. The response patterns, for all three questions are somewhat similar and generally reflect the type of industry data summarized in Table 18. Thus, current usage, instructional design approach, and past usage generally appear to be distributed relatively evenly in two categories.
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("transportation/communication," "public administration"), with variances in the other eight categories.

<table>
<thead>
<tr>
<th>Organization Type</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
<th>None</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question: Does your organization utilize PBT approaches to instructional design?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Manufacturing</td>
<td>12</td>
<td>16.0</td>
<td>6</td>
<td>8.0</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>2. Health Services</td>
<td>1</td>
<td>1.3</td>
<td>3</td>
<td>4.0</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>3. Transportation/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>3</td>
<td>4.0</td>
<td>4</td>
<td>5.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>4. Educational Services</td>
<td>2</td>
<td>2.7</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>5. Wholesale/Retail Trade</td>
<td>0</td>
<td>0.0</td>
<td>6</td>
<td>8.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>6. Public Administration</td>
<td>5</td>
<td>6.7</td>
<td>3</td>
<td>4.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>7. Finance/Insurance/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banking</td>
<td>1</td>
<td>1.3</td>
<td>5</td>
<td>6.7</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>8. Utilities</td>
<td>9</td>
<td>12.0</td>
<td>3</td>
<td>4.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. Business Services</td>
<td>6</td>
<td>8.0</td>
<td>2</td>
<td>2.7</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>10. Other (Mining,</td>
<td>2</td>
<td>2.7</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Construction,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization Type</td>
<td>Yes</td>
<td>%</td>
<td>No</td>
<td>%</td>
<td>None</td>
<td>%</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-----</td>
<td>-----</td>
<td>----</td>
<td>-----</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td>Question: Has your organization used PBT approaches in the past?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Manufacturing</td>
<td>10</td>
<td>13.3</td>
<td>8</td>
<td>10.7</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>2. Health Services</td>
<td>1</td>
<td>1.3</td>
<td>3</td>
<td>4.0</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>3. Transportation/Communication</td>
<td>3</td>
<td>4.0</td>
<td>4</td>
<td>5.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>4. Educational Services</td>
<td>2</td>
<td>2.7</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>5. Wholesale/Retail Trade</td>
<td>1</td>
<td>1.3</td>
<td>5</td>
<td>6.7</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>6. Public Administration</td>
<td>4</td>
<td>5.3</td>
<td>4</td>
<td>5.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>7. Finance/Insurance/Banking</td>
<td>1</td>
<td>1.3</td>
<td>5</td>
<td>6.7</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>8. Utilities</td>
<td>5</td>
<td>6.7</td>
<td>7</td>
<td>9.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. Business Services</td>
<td>5</td>
<td>6.7</td>
<td>3</td>
<td>4.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>10. Other (Mining, Construction, Agriculture, etc.)</td>
<td>1</td>
<td>1.3</td>
<td>1</td>
<td>1.3</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Table 25 displays ratios between "yes" and "no" responses to the three usage questions by organization types. "Manufacturing" respondents reported the highest ratio of current use to no use. Respondents classifying their organizations in the "wholesale/retail trade" category reported the lowest current use. Other low categories were "Health Services," "Finance/Insurance/Banking." The other highest categories were "Educational Services," "Business Services" and "Other." Reports of past use were more evenly divided except for "health services" and "Finance/Insurance/Banking." Noteworthy are the ratios for "utilities" and "Business Services." They report three times as many instances of the use of PBT approaches to instructional design. These ratios suggest that systematic approaches to design may be increasing in use.
<table>
<thead>
<tr>
<th>Organization Type</th>
<th>Usage Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes:No Current</td>
</tr>
<tr>
<td></td>
<td>Yes:No Past</td>
</tr>
<tr>
<td></td>
<td>Yes:No Design</td>
</tr>
<tr>
<td>1. Manufacturing</td>
<td>3.5:1</td>
</tr>
<tr>
<td></td>
<td>1.25:1</td>
</tr>
<tr>
<td></td>
<td>2.1:1</td>
</tr>
<tr>
<td>2. Health Services</td>
<td>1:3</td>
</tr>
<tr>
<td></td>
<td>1:3</td>
</tr>
<tr>
<td></td>
<td>1:3</td>
</tr>
<tr>
<td>3. Transportation/Communication</td>
<td>1:2.5</td>
</tr>
<tr>
<td></td>
<td>1:1.3</td>
</tr>
<tr>
<td></td>
<td>1:1.3</td>
</tr>
<tr>
<td>4. Educational Services</td>
<td>2:0</td>
</tr>
<tr>
<td></td>
<td>2:0</td>
</tr>
<tr>
<td></td>
<td>2:0</td>
</tr>
<tr>
<td>5. Wholesale/Retail Trade</td>
<td>0:6</td>
</tr>
<tr>
<td></td>
<td>1:5</td>
</tr>
<tr>
<td></td>
<td>0:6</td>
</tr>
<tr>
<td>6. Public Administration</td>
<td>1:1</td>
</tr>
<tr>
<td></td>
<td>1:1</td>
</tr>
<tr>
<td></td>
<td>1.7:1</td>
</tr>
<tr>
<td>7. Finance/Insurance/Banking</td>
<td>1:5</td>
</tr>
<tr>
<td></td>
<td>1:5</td>
</tr>
<tr>
<td></td>
<td>1:5</td>
</tr>
<tr>
<td>8. Utilities</td>
<td>1.4:1</td>
</tr>
<tr>
<td></td>
<td>1:1.4</td>
</tr>
<tr>
<td></td>
<td>3:1</td>
</tr>
<tr>
<td>9. Business Services</td>
<td>2.5:1</td>
</tr>
<tr>
<td></td>
<td>1.7:1</td>
</tr>
<tr>
<td></td>
<td>3:1</td>
</tr>
<tr>
<td>10. Other (Mining, Construction,</td>
<td>2:0</td>
</tr>
<tr>
<td>Agriculture, etc.)</td>
<td>1:1</td>
</tr>
<tr>
<td></td>
<td>2:0</td>
</tr>
</tbody>
</table>

Table 26 portrays a summary of responses by organization size and current use of performance-based training. Larger organizations (2,500 or more) appear to be greater employers of PBT than organizations in the other three categories. Tables 27 and 28 provide summaries of responses by organization size and the instructional design and past use questions, respectively. Large organizations also appear to be greater users of PBT design approaches. Table 28 suggests that organizations were less likely to have used PBT approaches in the past (larger percentages of "no" responses were recorded relative to the other two
usage questions). The yes/no response patterns in these data sets are also similar, as noted in the above tables. The total percentages of the pattern of response by organizational size also closely approximate the percentages per size category depicted in Table 20.

Table 26 suggests that very small organizations (under 100 employees) are approximately evenly divided in terms of current employment of PBT approaches. Slightly larger companies (100 to 499) report fewer instances of use. Larger companies (2,500 or more) report the most instances of current use.
### Table 27.
ORGANIZATION SIZE AND EMPLOYMENT OF PERFORMANCE-BASED APPROACHES TO INSTRUCTIONAL DESIGN

<table>
<thead>
<tr>
<th>Organization Size</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
<th>None</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question: Does your organization utilize PBT approaches to instructional design?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Under 100</td>
<td>7</td>
<td>9.3</td>
<td>5</td>
<td>6.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. 100 to 499</td>
<td>7</td>
<td>9.3</td>
<td>7</td>
<td>9.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. 500 to 2,499</td>
<td>13</td>
<td>17.3</td>
<td>12</td>
<td>16.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4. 2,500 or more</td>
<td>14</td>
<td>18.7</td>
<td>8</td>
<td>10.7</td>
<td>2</td>
<td>2.7</td>
</tr>
</tbody>
</table>

The data depicted in Table 27 suggests that the use of performance-based approaches to instructional design are relatively evenly divided in the first three response categories (organizations under 2,500 employees). However, respondents from larger organizations (2,500 or more) reported greater use (approximately 64% of the yes/no response total).
<table>
<thead>
<tr>
<th>Organization Size</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
<th>None</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question: Has your organization used PBT approaches in the past?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Under 100</td>
<td>8</td>
<td>10.7</td>
<td>4</td>
<td>5.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. 100 to 499</td>
<td>5</td>
<td>6.7</td>
<td>9</td>
<td>12.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>3. 500 to 2,499</td>
<td>9</td>
<td>12.0</td>
<td>16</td>
<td>21.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>4. 2,500 or more</td>
<td>11</td>
<td>14.7</td>
<td>11</td>
<td>14.7</td>
<td>2</td>
<td>2.7</td>
</tr>
</tbody>
</table>

The data displayed in Table 28 suggests that organizations of over 100 employees used PBT less in the past than very small organizations (under 100 employees) when compared to the data in Tables 26 and 27 (current use and instructional design approaches) the data suggests that use is increasing since greater instances of current use were reported than past use in the same categories. Table 29 portrays rations of yes/no responses to the usage questions by organization size. Ratios were developed to bring response patterns to light and provide a means for more easily comparing response categories. Most noteworthy are the ratios for the "2,500 or more" employee category. These also suggest that current use may be greater in larger organizations.
Table 29.
RATIOS OF YES/NO RESPONSES, ORGANIZATIONS SIZE AND USAGE QUESTIONS

<table>
<thead>
<tr>
<th>Organization Size</th>
<th>Yes:No Current</th>
<th>Usage Questions</th>
<th>Yes:No Past</th>
<th>Yes:No Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Under 100</td>
<td>1.2:1</td>
<td>2:1</td>
<td>1.4:1</td>
<td></td>
</tr>
<tr>
<td>2. 100 to 499</td>
<td>1:2.5</td>
<td>1:1.8</td>
<td>1:1</td>
<td></td>
</tr>
<tr>
<td>3. 500 to 2,499</td>
<td>1.1:1</td>
<td>1:1.8</td>
<td>1.1:1</td>
<td></td>
</tr>
<tr>
<td>4. 2,500 or more</td>
<td>2.1:1</td>
<td>1:1</td>
<td>1.75:1</td>
<td></td>
</tr>
</tbody>
</table>

Tables 30 provides a summary of responses by training department size and current use of performance-based training. Tables 30 and 31 provide summaries of responses by training department size and the instructional design and past use questions, respectively. Patterns similar to those noted for the other two variables and percentage patterns per department size as noted in Table 16 also hold true. In terms of current employment (Table 30) respondent organizations with no distinct function reported no instances of employment. Smaller departments (one to five employees) were evenly distributed between yes/no responses. The larger departments (six and up) reported increasingly higher percentages of employment.
<table>
<thead>
<tr>
<th>Training Department Size</th>
<th>Yes %</th>
<th>No %</th>
<th>None %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question: Is your organization currently employing PBT approaches?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. None, no distinct function</td>
<td>0 0.0</td>
<td>6 8.0</td>
<td>0 0.0</td>
</tr>
<tr>
<td>2. One</td>
<td>4 5.3</td>
<td>5 6.7</td>
<td>0 0.0</td>
</tr>
<tr>
<td>3. 1 to 5</td>
<td>12 16.0</td>
<td>13 17.3</td>
<td>2 2.7</td>
</tr>
<tr>
<td>4. 6 to 10</td>
<td>4 5.3</td>
<td>2 2.7</td>
<td>1 1.3</td>
</tr>
<tr>
<td>5. 11 to 20</td>
<td>7 9.3</td>
<td>2 2.7</td>
<td>0 0.0</td>
</tr>
<tr>
<td>6. 20 or more</td>
<td>13 17.3</td>
<td>2 2.7</td>
<td>1 1.3</td>
</tr>
</tbody>
</table>
The same situation held true with reported use of PBT instructional design approaches (Table 31). "No distinct function" respondents reported no use, smaller departments were evenly divided, and increasingly larger departments reported increasing use.

In the case of past PBT employment (Table 32) all smaller department categories (five and under employees) reported not having employed PBT approaches in the past about twice as often as the larger departments. This provides some indication that use in smaller departments is increasing.
## TABLE 32.

TRAINING DEPARTMENT SIZE AND PAST EMPLOYMENT OF PERFORMANCE-BASED TRAINING APPROACHES

<table>
<thead>
<tr>
<th>Training Department Size</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
<th>None</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question: Has your organization used PBT approaches in the past?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. None, no distinct function</td>
<td>0</td>
<td>0.0</td>
<td>4</td>
<td>5.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. One</td>
<td>4</td>
<td>5.3</td>
<td>7</td>
<td>9.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>3. 1 to 5</td>
<td>9</td>
<td>12.0</td>
<td>17</td>
<td>6.3</td>
<td>1</td>
<td>2.3</td>
</tr>
<tr>
<td>4. 6 to 10</td>
<td>5</td>
<td>6.7</td>
<td>3</td>
<td>4.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>5. 11 to 20</td>
<td>5</td>
<td>6.7</td>
<td>3</td>
<td>4.0</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>6. 20 or more</td>
<td>10</td>
<td>13.3</td>
<td>6</td>
<td>8.0</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table 33 provides ratios of yes/no responses to the three usage questions by training department size. Smaller departments (one to five) reported an approximately even number of yes/no responses. Those respondents classifying their organizations as having no distinct function showed low use ratios. The highest ratios (yes to no) were produced by departments of six and above employees, with the ratio increasing as department size category increased.
TABLE 33.
RATIOS OF YES/NO RESPONSES,
TRAINING DEPARTMENT SIZE AND USAGE QUESTIONS

<table>
<thead>
<tr>
<th>Training Department Size</th>
<th>Usage Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes:No Current</td>
</tr>
<tr>
<td>1. Name, no distinct function</td>
<td>0:6</td>
</tr>
<tr>
<td>2. One</td>
<td>1:1.25</td>
</tr>
<tr>
<td>3. 1 to 5</td>
<td>1:1.1</td>
</tr>
<tr>
<td>4. 6 to 10</td>
<td>2:1</td>
</tr>
<tr>
<td>5. 11 to 20</td>
<td>3.5:1</td>
</tr>
<tr>
<td>6. 20 or more</td>
<td>6.5:1</td>
</tr>
</tbody>
</table>

Attitude Toward Performance-Based Training and Selected Variables

This section addresses the research question related to relationships (degree of association) between attitude scale scores of respondents and selected variables. The variables examined were as follows:

1. Level of education
2. Experience in the training and development/HRD field
3. Types of performance-based training experience
4. Organization size
5. Training department size

The variable data provided by the questionnaire items of the instrument for the variables noted above was, as raw data, categorical in nature. In order to obtain data that could be used, at least to a limited degree, to examine degrees of relationship, the raw data were converted.
to ordinal form by assigning values and ranking the values. The level of education variable contained four categories, each of which were assigned values of one through five in ascending order from "no college degree" to "doctoral." These values are noted below:

- No college degree: "1"
- Bachelor's degree: "2"
- Bachelor's degree +: "3"
- Master's: "4"
- Doctoral: "5"

The conversion of these variables to ordinal form provided a limited measure of relationship, since the range of values was small (producing a limited number of ranks). Each of the other variables was treated in the same fashion except for types of performance-based experience, which contained categories of types of experiences with performance-based training. In this case, respondents were assigned a value of "1" for each type of experience they reported having. Values ranged from zero (no experience) to four (experiences in all four types of categories).

To examine possible relationships between attitude scale scores and the five variables noted above, Spearman Rho correlations were computed for each variable (Table 34).
The size of a correlation coefficient indicates the degree of relationship, whereas the direction is indicated by the sign of the computed coefficient. Warmbrod (1981) offers some conventions for the description of relationships:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>.70 or higher</td>
<td>Very strong relationship (association)</td>
</tr>
<tr>
<td>.50 to .69</td>
<td>Substantial relationship</td>
</tr>
<tr>
<td>.30 to .49</td>
<td>Moderate relationship</td>
</tr>
<tr>
<td>.11 to .29</td>
<td>Low relationship</td>
</tr>
<tr>
<td>.01 to .09</td>
<td>Negligible relationship</td>
</tr>
</tbody>
</table>

As noted in Table 34, negligible positive relationships were described by the coefficients computed for educational level and experience level. The coefficients computed for types of performance-
based training experience and attitude indicates a moderately positive relationship. The organizational size variable when correlated with attitude score produced a low, negative coefficient. The last variable, training department size, produced a low, positive coefficient.

This chapter presented the analysis of the study data and a discussion of findings. It includes a description of respondents, an analysis of reported employment of performance-based approaches, and an analysis of trainer attitudes in relation to selected variables. The last chapter provides a summary of the study, conclusions, and recommendations.
CHAPTER V
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The research problem of this study was to examine trainer attitudes in relation to the performance-based training instructional model and trainer perceptions about the use of this model to deliver training in U.S. organizations. The research questions formulated to direct the study were:

1. What are trainer attitudes toward performance-based training approaches?

2. What are trainers' perceptions about the extent of performance-based training use?

The necessary data for this study were collected by using a two-part survey instrument. The first part of the instrument contained a concept description of the performance-based training model and an attitude scale. This part provided attitude measurement data. The second part of this instrument contained a questionnaire. One set of questionnaire items was designed to produce data that could be used to describe the respondents and their organizations. Another set of questions was designed to produce data to describe trainer perceptions about the employment of performance-based training approaches.

Methodology

A review of literature was conducted to obtain information about current performance-based training practice, attitudes, instructional
design, and the evolution of performance-based training. The review included an examination of public and private sector training practice, the elements and characteristics of performance-based approaches, the nature of attitudes and attitude measurement, and instrument validity and reliability.

An attitude scale to measure the construct, performance-based training, was developed. A construct definition, derived from the literature was developed. To accumulate positive and negative reactions (indicators of attitude) practitioners were asked to create lists of their reactions to the concept or construct definition. Additional perceived positive and negative characteristics were derived from the literature. These reactions and perceived characteristics were combined into a list and written into statement form and presented to judges who were asked to choose what they felt were the best thirty positive and negative statements.

These sixty statements were combined in a preliminary instrument and mailed, with the concept description, to a group of practitioners. An item analysis of practitioner responses resulted in a final 20-item scale. The final scale was mailed to a random sample of the study frame to gather population data to estimate required sample size. Reliability and validity were estimated using the KR-21 formula, data from the literature review, input from practitioners, and the opinions of judges. The instrument was then administered to a random sample of practitioners drawn from the American Society for Training and Development (ASTD) membership roster.
A questionnaire was developed concurrently with the attitude scale to obtain data related to selected variables and perceived performance-based training usage. The questionnaire items addressed basic respondent characteristics, performance-based training experience, and organizational use of performance-based training. A field test was conducted to refine the questionnaire. It was then administered in tandem with the attitude scale.

The data were then analyzed using the Minitab data analysis software package. The analysis resulted were used to answer the stated research questions. The data were presented in the form of descriptive statistics.

**Major Findings and Discussions**

Based on the data collected in this study, major findings are summarized in the following sections.

**Respondent Profiles**

The respondent group as a whole reported itself as being well-educated. Sixty-four percent of respondents reported possessing a master's level degree or greater. Seventy-one respondents (94.6%) indicated that they held some type of post-secondary degree.

The respondents also appeared to be experienced in the training and development field. Approximately 40% of the group reported ten or more years of experience, while only 13.3% reported three years or less experience. A large percentage (77.3%) also indicated that they had some type of experience with performance-based training approaches.
HRD managers (of training/HRD functions) comprised over half of the respondent group (54.7%). The manufacturing and utility industries together comprised a large percentage of the sample (41.3%). Larger organizations also appeared to dominate the sample (65.3%).

In terms of training department size, small departments of one to five employees comprised a significant percentage (50.7%) of the sample, with large departments (20 or more) also comprising a significant portion of the sample (21.3%). These findings are supported by the literature which suggests that smaller departments are the norm with only large organizations being able to support larger training and development/HRD staffs.

Studies Involving Similar Populations

An examination was made of other descriptive studies involving training and development/HRD populations (Rose, 1984; Chang, 1985; Vanterpool, 1987; Lakewood Research, 1986, 1987, 1988, 1989). The data suggest that the composition of the ASTD frames (American Society for Training and Development national membership rosters) used for the Rose, Chang, and Vanterpool studies (and this study) has changed little during the period 1984 to 1989. Although only two categories (educational level and organizational position) were directly comparable, response patterns for most categories were similar. Reported educational levels (no degree, bachelor's, master's, doctorate) were very similar. Reports of organizational position (manager/non-manager) were also very similar, with a little over half of respondents reporting themselves as being function managers.
A comparison of all eight studies raised some questions. Although response patterns for most items were comparable across the studies, educational level reports collected by the Lakewood studies differed noticeably in two categories from the ASTD studies (no degree, master’s degree). The Lakewood Study populations were based upon Training magazine subscription lists. Year-to-year responses were very similar for the four Lakewood studies. Reports of "no degree" in the Lakewood studies were generally over twice those of the ASTD studies, with about an eleven point difference (ASTD average 7.8%). Reports of "master’s degree" in the Lakewood studies averaged 39.6% of the samples, while the ASTD studies averaged 47.4%, a 7.8 point difference. To what may the differences in these two categories be attributed? Are ASTD members more likely to hold a master’s degree? Are they less likely to be non-degreeed? Further studies should address these variances.

Performance-Based Training Activity

Overall responses ("yes" or "no") to the question addressing performance-based training activity were approximately evenly divided in all three response categories. These categories were 1) current use of performance-based training approaches, 2) use of performance-based approaches to instructional design, and 3) past use of performance-based approaches.

Analysis of organization type and the above response categories indicate that "yes" and "no" responses are spread across industry types. No obvious concentrations occur in any particular industry.

Larger (500 and above) organizations more often report to be currently using performance-based training delivery approaches (27.3%),
performance-based instructional design approaches (36.5%) and to have used performance-based approaches to delivery in the past (26.7%). Organizations with larger training departments (six or more employees) were reported most often as currently using performance-based approaches (31.9%), using performance-based approaches to instructional design (36.0%), and as having used performance-based approaches in the past (26.7%).

**Instructional Systems Design**

The instructional systems development literature suggests some recurring concerns. Two of the most prominent seem to center around cognitive task analysis and instructional design algorithms.

Hanuum and Hansen (1989), Jackson (1989), Foshay (1989), Wilson and Welch (1986), Caster (1985), Tieman and Markle (1985) and Romiszowski (1981) writing over about an eight-year period have all noted that instructional designs could be improved by better applying existing knowledge about cognition to task analysis. They feel that improved application would aid in better specifying what must be "known" to perform a given job.

Hanuum and Hansen (1989), Cummings (1989), Geis (1987), Gropper and Ross (1987), and Romiszowski (1981) have all noted that there is a need for development of instructional design algorithms to aid in instructional system design.

**Attitudes Toward Performance-Based Training**

The attitude scale employed in this study was designed, given score value assignments for one to five, to have a total score range of 20 to 100, with a scale midpoint of 60. Scores above 60 could then be
viewed as representing a "positive" attitude and scores below 60 a "negative" attitude. Respondent scores ranged from 53 to 96 with a mean score of 77.77. As noted earlier, duration scores indicate a relatively narrow spread of scores. This data suggests that survey respondents held a generally positive attitude toward the construct performance-based training. As Vecchio (1989) noted, many variables can affect attitude. Performance-based systems emphasize measurable outcomes. The literature suggests that dissatisfaction with often-used measurement and evaluation techniques employed to evaluate training programs could be an important variable influencing attitude.

Clark (1989), Hanuum and Hasen (1989), Campbell and Hatcher (1989), Schrock and Coscarelli (1989), Geis (1987), Godkewitsch (1987) and Clegg (1987) all suggest that over-all, evaluation of the instructional effectiveness and organizational value of training is inadequate. If this attitude is prevalent among practitioners, then systematic instructional models might be viewed more favorably than more traditional or conventional models.

The data related to attitude scale scores and selected variables suggests that a moderate positive relationship might exist between types of performance-based training experiences and attitudes toward performance-based training. That is, more experiences with performance-based training may be reflected by a more "positive" attitude. This supports the well-supported link between direct experience and attitude noted by Vecchio (1989).

Data describing attitudes is also useful in terms of predicting behavior (Kriertner and Kinicki, 1989). The Ajzen and Fishbein model
(1980) used to explain attitude-behavior relationships holds a individual's intention to engage in a given behavior as the best predictor of that behavior. Attitudes and subjective norms are viewed as directly influencing intent to behave. Attitudes and subjective norms are viewed as in turn being influenced by belief systems. A meta-analysis by Steele and Ovalle (1984) of 34 employee turnover studies found that stated intent to behave in a certain way was a better predictor of turnover than job satisfaction, work satisfaction, or organizational commitment. Thus, attitude toward performance-based training may influence behavioral intentions and consequent workplace behavior.

Conclusions

Based upon the findings of this study and the review of literature a number of generalizations can be made about the employment of performance-based training in U.S. organizations, trainer attitudes toward performance-based training, and training and development/HRD populations. These generalizations follow.

1. The respondent group appears to be well-educated. Most of the group reported at least a bachelor's degree or greater. Approximately two-thirds of the group reported holding a master's or doctoral degree. The most educated group appeared to be respondents employed by utilities. The second most-educated and least-educated groups reported themselves as being employed in manufacturing. This suggests that perhaps education levels may vary by type of manufacturing. The data also suggest that respondents classifying themselves as managers were the most educated group. Managers who had other managers reporting to them appeared to be the most educated group with approximately 75% reporting holding either a master's or doctoral degree.

2. Respondents appeared to be experienced in the training and development/HRD field. Nearly 87% of respondents reported more than four years of experience.
3. A significant percentage of respondents (77.3%) reported some type of experience with performance-based training. This percentage was greater than anticipated based upon the literature review.

4. The data suggest that no relationship exists between length of experience in the training and development/HRD field and simple exposure to performance-based training in some form. It does suggest a relationship between length of experience and exposure to or experience with PBT in different ways (as an instructor, program participant, and so on).

5. The extent of performance-based training usage reported was greater than anticipated, based upon indications of usage noted in the literature. Reports of usage in the literature are primarily education/public-sector based, with limited industrial references. Survey results show that approximately half of all respondents' organizations employ or have employed performance-based training. These results indicate that performance-based training usages may be more widespread than commonly believed by some.

6. The data indicates that performance-based training is employed more often in large (over 500 employees) organizations.

7. The data appears to show that performance-based training usage may be spread more across organization types than the literature indicates. Literature references are generally based in the manufacturing or utilities industries. The respondents reported that performance-based training is employed in all ten categories of organizations used in the questionnaire except the "wholesale/retail trade" category.

8. Training department size appears to be a factor in terms of employment of performance-based training approaches. Respondents from departments of "20 or more" employees reported more instances of use than any other category.

9. In terms of relationships between attitude toward performance-based training and the variables selected for analysis, the one association indicated by the data was between attitude and the number of different types of performance-based training experiences reported. That is, the more different types of experience with performance-based training, the greater the positive attitude.

10. Respondent attitudes toward performance-based training appear to be generally positive. Scale scores fell mostly above the scale mid-point. This suggests positive reaction to the construct. The literature suggests that positive
reaction may be notably affected by certain variables. These include dissatisfaction among trainers with evaluation practices employed by organizations not using systematic approaches to instructional design. Less systematic approaches appear not to focus on measurement of employee performance, emphasizing process rather than product. Other variables may relate to organizational pressures to document training results with hard data, an increasing emphasis on testing and certification, and pressure to provide more cost-effective training.

11. The attitude scale developed for this study appears to possess some measure of validity. This is supported by the descriptive statistics computed for the scale scores. These data indicate some degree of variability in scale scores and only a slightly skewed distribution of scores. This suggests that the instrument is measuring some construct.

12. The use of performance-based approaches appears to be increasing across organization types except for wholesale/retail trade organizations.

13. Manufacturing, utilities, and business service industries appear to be the greatest users of performance-based approaches.

14. The data seems to indicate that health, finance, insurance, banking, wholesale, and retail industries employ performance-based approaches the least.

15. The compositions of training and development/HRD populations appear to have changed little, in terms of the variables investigated by this study, during the period 1984 to 1989.

Recommendations

Based upon the data acquired during this study and the conclusions presented above, the following recommendations are made:

1. Further research should be conducted to build support for the reliability and validity of the attitude scale developed for this study.

2. The population studied should be expanded by sampling all U.S. training and development/HRD practitioners. This frame, if available in the future would provide a clearer picture of practice within U.S. organizations and attitudes of trainers.
3. Other, like those noted in the discussion and conclusion sections, variables that might affect attitude and usage should be examined.

4. Further research should be conducted to examine the specific nature of instructional systems classed as "performance-based."

5. Further research should be conducted to examine the nature of evaluation practice across organization types.

6. Further research should be conducted to examine cost-benefit relationships between performance-based systems and other systematic or traditional approaches.

7. Research should be conducted to investigate specific learning outcomes produced by PBT systems in comparison to other systems.

8. Further research should be conducted to examine the disadvantages or perceived disadvantages associated with PBT system use compared to the systematic models.
BIBLIOGRAPHY


Scharf, J.S. (1988). What the fox needs to know. The University of Texas at Austin: Innovation Abstracts, 10(28).


APPENDICES
APPENDIX A

REQUEST LETTER FOR POSITIVE AND NEGATIVE REACTIONS TO PERFORMANCE-BASED TRAINING
Dear Ms. Patrick:

I am a graduate student completing a Training and Development program at the Ohio State University. I'm also in the beginning stages of a research project related to performance-based (competency-based) training approaches to instruction.

Just a few minutes of your time will help me get this project off the ground. I need your reactions to the concept described on page 2 of this letter. Your reactions will help form the basis of an attitudinal instrument.

Simply read the list of characteristics on page 2, then turn to page 3 and jot down any reactions, positive or negative, that immediately come to mind. There is no maximum or minimum number, but 5 or 10 responses would be reasonable. Enclosed is a self-addressed, stamped envelope for your responses.

Thank you very much for your help.

Sincerely,

David J. Kalmas
6373 Amston Drive
Dublin, OH 43017
APPENDIX B

PERFORMANCE-BASED TRAINING CONSTRUCT DESCRIPTION
PERFORMANCE-BASED TRAINING

Performance-based training can be considered as having the following characteristics:

1. Training is based upon job competencies (the knowledge, skills, or attitudes required by a worker to perform given job tasks) that have been identified (e.g., by conducting a rigorous job/task analysis) and verified as truly being required for successful job or task performance.

2. The criteria to be used in assessing trainee achievement of the competencies are explicitly stated and known to the trainee.

3. Instructional materials and methods are designed and chosen to reflect individual differences among trainees (i.e., differences in learning style, ability, etc.).

4. Trainees proceed at a pace most suitable for them and move forward only when they have demonstrated attainment of particular competencies.

5. Assessment of competency achievement requires actual performance of the competency.

A typical PBT program might be described by statements like these:

- What is to be learned is clearly stated in terms of well-written performance objectives (stated performance/conditions/criteria)
- Instructional materials are keyed to verified competencies
- Trainees know how, why, when, and where they will be evaluated
- Instructors act more as resource persons or managers of learning rather than as "teachers"
- Instructors work more with students individually and in small groups rather than lecturing in large groups
- There is less reliance on paper-and-pencil tests, and more reliance on performance observation
- Trainees most often work alone or in small groups
- Trainees work at their own best pace
- Program completion depends upon competency attainment—and performance demonstration in a realistically simulated or actual work situation
- Multiple learning options are available—media packages, programmed instructional materials, and so on
- Trainees are provided with learning guides that provide direction in terms of learning options
APPENDIX C

PERFORMANCE-BASED TRAINING REACTION FORM
PERFORMANCE-BASED TRAINING

Positive Reactions

Negative Reactions
APPENDIX D
STUDY PARTICIPANTS,
POSITIVE AND NEGATIVE REACTIONS, JURIES
FIELD TEST PARTICIPANTS
Respondents, Positive and Negative Reaction Request

Catherine L. Burton  
Resource Development Specialist  
GM/UAW Pontiac Retraining Program

Donald W. Kurtz  
Manager, Development/Training  
Kodak Research Labs

Elaine Adler  
Director of Training  
Citibank

Susan C. Willis-Yeck  
Supervisor, Nuclear Training Development  
Virginia Power Corporation

Nona E. Smith  
Training and Educational Research  
Bell Labs, AT&T

Tom Pfeiffer  
Director of Training  
Arkansas Oklahoma Gas Company

Kenneth J. Nichols  
Manager, Training and Development  
International Paper Company

Jim Myers  
Training Director  
Union Carbide Company

Donald Jenkins  
Training Supervisor  
Pratt and Whitney

Richard C. Douglas  
Education and Training Officer  
U.S. Air Force

Denise C. Humphreys  
Training Specialist  
Idaho Power Company

Arthur J. Halliday  
Training Coordinator  
ARCO Petroleum Products

Peggy Patrick  
Training Coordinator  
Arkansas Power and Light Company
Jury, 60-Item Instrument

Carey R. George
Training Coordinator
Navistar International

Sam K. Burcham
Training Specialist
BMY Corporation

Claude Beverly
Training Manager
Martin-Marietta Corporation

Construct Jury

Carey R. George
Training Coordinator
Navistar International

Sam K. Burcham
Training Specialist
BMY Corporation

C. Charelston
Technical Training Manager
YSI Corporation

Field Test Participants

Jack Kristofco
Dean, Developmental Education
Clark State Community College

Jan R. Hillman
President
Hillman and Associates

Donald Miller
President
R.D. Pearson and Associates

Joan E. Berry
Regional Human Resources Manager
Kinder-Care Learning Centers, Inc.
APPENDIX E
PRELIMINARY INSTRUMENT
Dear Colleague:

I am doing a study that involves training and development of practitioner attitudes toward performance-based (competency-based) training.

Development of an appropriate instrument to measure these attitudes requires that I ask a small number of HRD practitioners to complete a preliminary instrument.

I need your help. Every response is important. Please take the few minutes necessary to complete this preliminary instrument.

Instructions are on page 1.

I really appreciate your help.

I have enclosed a self-address, stamped envelope for your convenience.

Sincerely,

Dave Kalamas
INSTRUCTIONS

1. The concept of performance-based (competency-based) training is described on the next page. Part I describes the generally accepted characteristics of PBT programs. Part II provides descriptive statements that would apply to ideal programs. This description is one that those who favor or support PBT programs might provide.

2. Read both Part I and Part II, then turn to the next page.
PERFORMANCE-BASED TRAINING (PBT)

Performance-based training can be considered as having the following critical characteristics:

1. Training is based upon job competencies (the knowledge, skills, or attitudes required by a worker to perform given job tasks) that have been identified (e.g., by conducting a rigorous job/task analysis) and verified as truly being required for successful job or task performance.

2. The criteria to be used in assessing trainee achievement of the competencies are explicitly stated and known to the trainee.

3. Instructional materials and methods are designed and chosen to reflect individual differences among trainees (i.e., differences in learning style, ability, etc.).

4. Trainees proceed at a pace most suitable for them and move forward only when they have demonstrated attainment of particular competencies.

5. Assessment of competency achievement requires actual performance of the competency.

An ideal PBT program might be described by statements like these:

- What is to be learned is clearly stated in terms of well-written performance objectives (stated performance/conditions/criteria)
- Instructional materials are keyed to verified competencies
- Trainees know how, why, when, and where they will be evaluated
- Instructors act more as resource persons or managers of learning rather than as "teachers"
- Instructors work more with trainees individually and in small groups rather than lecturing in large groups
- There is less reliance on paper-and-pencil tests, and more reliance on performance observation
- Trainees, as much as possible, work at their own best pace
- Program completion depends upon competency attainment—and performance demonstration in a realistically simulated or actual work situation
- Multiple learning options are available—media packages, programmed instructional materials, and so on
- Trainees are provided with learning guides that provide direction in terms of learning options
- Basic knowledge or background theory is learned as it is needed to support competency acquisition
- Trainees are given continual and detailed feedback on their progress
- Trainees with appropriate skills and knowledge may bypass instruction upon competencies already attained.
HOW DO YOU FEEL ABOUT PERFORMANCE-BASED TRAINING?

Below are statements regarding performance-based training (PBT). Please indicate the extent to which you agree or disagree with these statements by CIRCLING ONE of the following:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</table>

1. PBT is valuable because it is a learner-centered approach.  
2. PBT is useful because it is a practice-oriented approach.  
3. PBT is impractical because it requires too large an investment of resources.  
4. PBT is useful only for low-level technical skills.  
5. A PBT approach sounds good, but it really only lowers standards so that most of the trainees can meet course requirements.  
6. PBT fosters self-directed learning—important to adult learners  
7. PBT is an effective approach to instruction.  
8. In a PBT program too many trainees will not finish in a reasonable length of time.  
9. PBT is useful because it allows for effective evaluation of trainee performance.  
10. A PBT approach helps trainees learn by laying a foundation for future learning.  
11. PBT doesn’t allow instructors to provide immediate corrective feedback to trainees.  
12. PBT helps motivate slower learners because they can make notable progress—they can “see” the results of their efforts.  
13. PBT programs stifle instructor creativity.  
14. Forcing all trainees to acquire the same competencies is not treating them as individuals.  
15. PBT can assure that trainees reach an acceptable level of performance.
16. PBT is effective in minimizing competition, since absolute rather than relative standards are set for trainees.

17. Learning is enhanced with a PBT approach since it promotes more active mental involvement than most lecture-based approaches.

18. PBT often isn't workable, since competencies that involve things like problem-solving and decision-making can't be put down on paper.

19. Good instructors do the same things that are done in FBT programs.

20. PBT approaches are too expensive.

21. PBT is valuable because trainees must take responsibility for their own learning.

22. The small lesson units used in PBT programs allow for frequent feedback to trainees.

23. Using a PBT approach indicates to trainees that they are incapable of deciding what to learn.

24. PBT recognizes the enormous individual differences in rate of learning.

25. PBT promotes effective learning since it provides a great deal of evaluative feedback to learners.

26. PBT is useful since it allows trainee achievement to be documented.

27. A PBT approach works only with the best, most motivated trainees.

28. PBT is useful because learner accountability is built into the training.

29. PBT is good because it is learner-oriented rather than instructor-oriented—that is, there is more emphasis on the learner and the learning process than on the teaching process.

30. PBT requires too much record-keeping and documentation.

31. PBT approaches are not as effective as other approaches because trainees don't like to be continually evaluated.

32. It's too difficult to develop appropriate learning materials for PBT.

33. PBT is useful because trainees can monitor their progress.
34. PBT is useful because learners can get involved by helping establish their own learning plans/goals.  
35. PBT approaches should not be used because of the danger of failing to include really critical competencies in the training.  
36. PBT is useful because trainee groups of different sizes can be accommodated.  
37. The cost of individualized instruction in a PBT program makes it impractical in real-life situations.  
38. PBT is ineffective because there is not enough instructor-learner contact.  
39. PBT is useful because it allows trainees more flexibility in their learning efforts.  
40. PBT is not useful because it is too difficult to develop practical performance tests.  
41. PBT is a mechanical, inflexible, assembly-line approach to instruction.  
42. PBT does not permit enough student-instructor interaction.  
43. With a PBT approach, more trainees learn more.  
44. PBT is a good approach because training content is based upon actual job competencies.  
45. PBT is not a good approach because students learn a lot of isolated competencies that are never tied together.  
46. PBT allows for greater control over the learning process by the training function.  
47. PBT inhibits creative learning effort.  
48. PBT is not useful because the affective (attitudinal) area is usually ignored.  
49. PBT promotes blind faith in behavioral performance objectives as a cure-all for poor instruction.  
50. PBT is an effective approach because it allows for differences in skill and knowledge levels among trainees.  
51. PBT is effective because it allows for differences in trainee learning styles.
52. PBT approaches are usually fragmented, since they use small lesson units, often focusing on single concepts or very simple competencies.  

53. PBT results in "teaching to the test."  

54. PBT allows trainers to avoid teaching duties by letting trainees "go it alone."  

55. PBT improves the quality of instruction.  

56. PBT is a positive approach because it allows trainees to feel confident about their performance.  

57. PBT approaches don't allow for instructor creativity.  

58. PBT restricts breadth of learning.  

59. PBT is useful because it helps trainees "learn how to learn."  

60. PBT allows instructional developers/designers to eliminate non-essential, trivial learning.
APPENDIX F

ITEM ANALYSIS OF PRELIMINARY INSTRUMENT
ITEM ANALYSIS OF 60-ITEM PRELIMINARY INSTRUMENT BY
CORRELATION BETWEEN ITEM AND TOTAL SCORE

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APPENDIX G

FINAL SURVEY INSTRUMENT
Dear Colleague:

I am doing a study of training and development practitioner attitudes toward performance-based (competency-based) training.

Part of this study involves asking a number of HRD practitioners to complete an attitudinal instrument and a short questionnaire.

I need your help. Every response is very important to the outcome of this study.

Please take the few minutes necessary to complete the enclosed instrument and questionnaire by following these three steps.

1. Read the performance-based training (PBT) concept description on page 2.
2. Complete the instrument on page 3.
3. Answer the questions about you and your organization on page 4.

I really appreciate your help.

Enclosed is a self-addressed, stamped envelope for your convenience.

Sincerely,

[Signature]

Dave Kalamas

DK/db

Enclosure
PERFORMANCE-BASED TRAINING

Performance-based training (PBT) can be considered as having the following critical characteristics:

1. Training is based upon job competencies (the knowledge, skills or attitudes required by a worker to perform given job tasks) that have been identified (e.g., by conducting a rigorous job/task analysis) and verified as truly being required for successful job or task performance.

2. The criteria to be used in assessing trainee achievement of the competencies are explicitly stated and known to the trainee.

3. The instructional program provides for the individual development and evaluation of each specified competency.

4. Trainees proceed at a pace most suitable for them and move forward only when they have demonstrated attainment of particular competencies.

5. Assessment of competency achievement requires actual performance of the competency.

An ideal PBT program might be described by statements like these:

• What is to be learned is clearly stated in terms of well-written performance objectives (stated performance/conditions/criteria)

• Instructional materials are keyed to verified competencies

• Trainees know how, why, when and where they will be evaluated

• Instructors act more as resource persons or managers of learning rather than as "teachers"

• Instructors work more with trainees individually and in small groups rather than lecturing in large groups

• There is less reliance on paper-and-pencil tests, and more reliance on performance observation

• Trainees, as much as possible, work at their own best pace

• Program completion depends upon competency attainment -- and performance demonstration -- in a realistically simulated or actual work situation

• Multiple learning options are available -- media packages, programmed instructional materials, and so on

• Trainees are provided with learning guides that provide direction in terms of learning options

• Basic knowledge or background theory is learned as it is needed to support competency acquisition

• Trainees are given continual and detailed feedback on their progress

• Trainees with appropriate skills and knowledge may bypass instruction upon competencies already attained
## PERFORMANCE-BASED TRAINING APPROACHES

Instructions

Below are statements regarding performance-based training (PBT) approaches. Please indicate the extent to which you agree or disagree with each statement by **CIRCLING ONE** of the following:

**SA = Strongly Agree**  **A = Agree**  **U = Undecided**  **D = Disagree**  **SD = Strongly Disagree**

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<tr>
<th>Statement</th>
<th>SA</th>
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<td>20. PBT is useful because it helps trainees &quot;learn how to learn.&quot;</td>
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YOU AND YOUR ORGANIZATION

Instructions
Following are two sets of questions. The first set apply to you personally, the second set to your organization. Please read each item in both sets carefully and answer accordingly.

YOU

Education:
Please indicate your level of education. CHECK ONLY ONE ANSWER.
[ ] No college degree. [ ] Master's.
[ ] Bachelor's degree. [ ] Doctoral.
[ ] Bachelor's degree plus some graduate work.

Experience:
How long have you been working in the training and development/HRD field? CHECK ONLY ONE ANSWER.
[ ] Under 1 year. [ ] 4 to 10 years.
[ ] 1 to 3 years. [ ] Over 10 years.

Performance-Based Training Experience:
I have experience with PBT as:
[ ] A participant/learner.
[ ] A developer/designer of PBT programs.
[ ] A learner within an educational institution.
[ ] An observer (e.g., it was used elsewhere in my organization).
[ ] I have no direct experience with PBT.

Your Position:
Please check the block next to the position below that is most like your position. CHECK ONLY ONE ANSWER.
[ ] HRD Manager A. Other training/HRD managers report to me.
[ ] HRD Manager B. Manager or a training/HRD functional area with professional direct reports.
[ ] HRD Specialist. Instructor, instructional designer, organization development, or management development.
[ ] Other. Personnel manager, personnel specialist, other line or staff functions.

YOUR ORGANIZATION

Your Industry:
Please check the type of industry that best represents your organization's primary business. CHECK ONLY ONE ANSWER.
[ ] Manufacturing. [ ] Health Services.
[ ] Transportation/Communication. [ ] Educational Services.
[ ] Wholesale/Retail Trade. [ ] Public Administration.
[ ] Finance/Insurance/Banking. [ ] Utilities.
[ ] Business Services. [ ] Other.
(Mining, Construction, Agriculture, etc.)

Organization Size:
How many employees are there in your entire organization? CHECK ONLY ONE ANSWER.
[ ] Under 100. [ ] 500 to 2,499.
[ ] 100 to 499. [ ] 2,500 or more.

Training Department Size:
How many employees are in the functional area/unit responsible primarily for training and development? CHECK ONLY ONE ANSWER.
[ ] None, no distinct function. [ ] 6 to 10.
[ ] One. [ ] 11 to 20.
[ ] 1 to 5. [ ] 20 or more.

Performance-Based Training Activity:
Please answer Yes [Y] or No [N] to the following questions. CHECK ONLY ONE ANSWER.

Y N

Is your organization currently employing PBT approaches?

[ ]

Does your organization utilize PBT approaches to instructional design?

[ ]

Has your organization used PBT approaches in the past?

[ ]

THANK YOU
APPENDIX H

FOLLOW-UP REQUEST LETTER
Dear Colleague:

A few weeks ago you received a questionnaire that asked about your attitudes toward performance-based training.

I know your time is limited, but it is important that I obtain all the replies that I can. Please take the few minutes necessary to complete the survey I have enclosed.

Thank you very much for your help.

Sincerely,

Dave Kalamas

Enc.
APPENDIX I

NON-RESPONDENT REQUEST LETTER
Dear Colleague:

Some weeks ago you received a copy of the enclosed Performance-Based Training instrument.

I realize that your time is limited, but it would be very helpful to the outcome of my study to get some information about the members of my sample who did not respond. This information will permit a much better analysis of the data I've collected.

Thank you again for your time.

Sincerely,

Dave Kalamas

DJK/bd

enc.