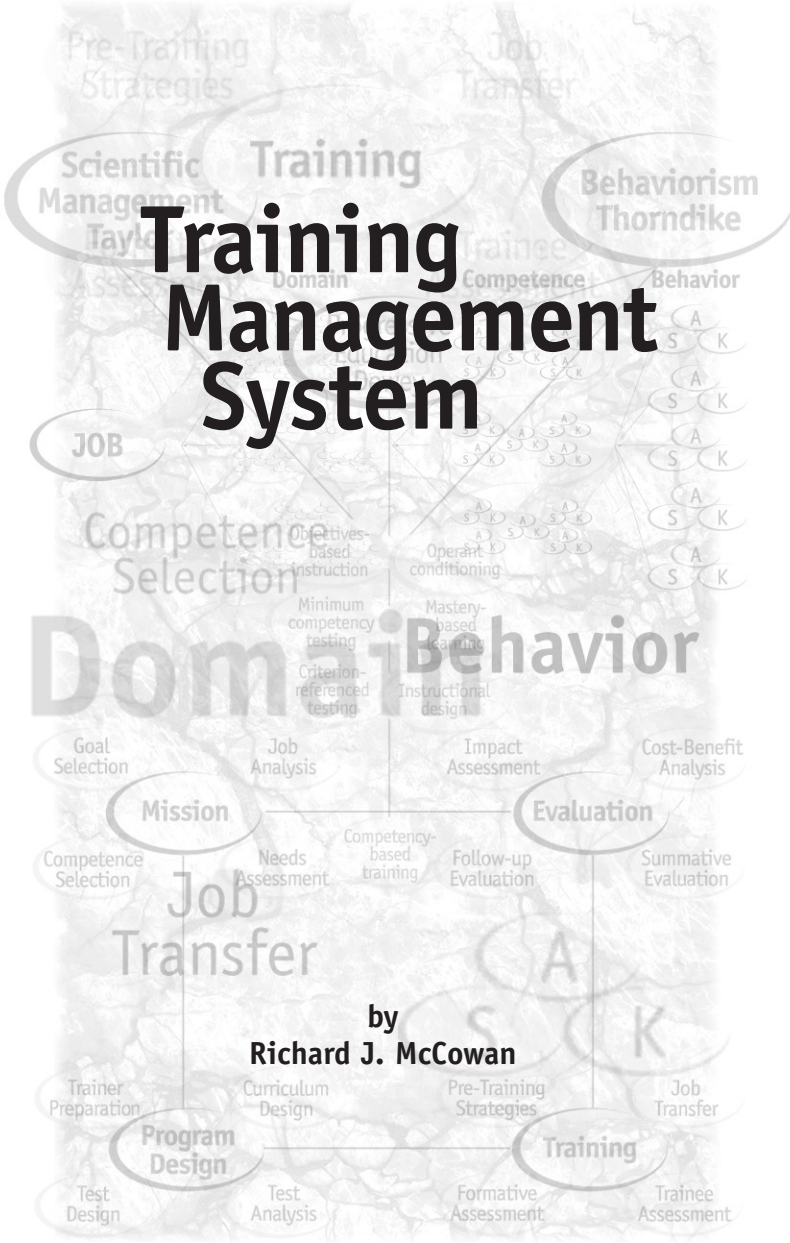
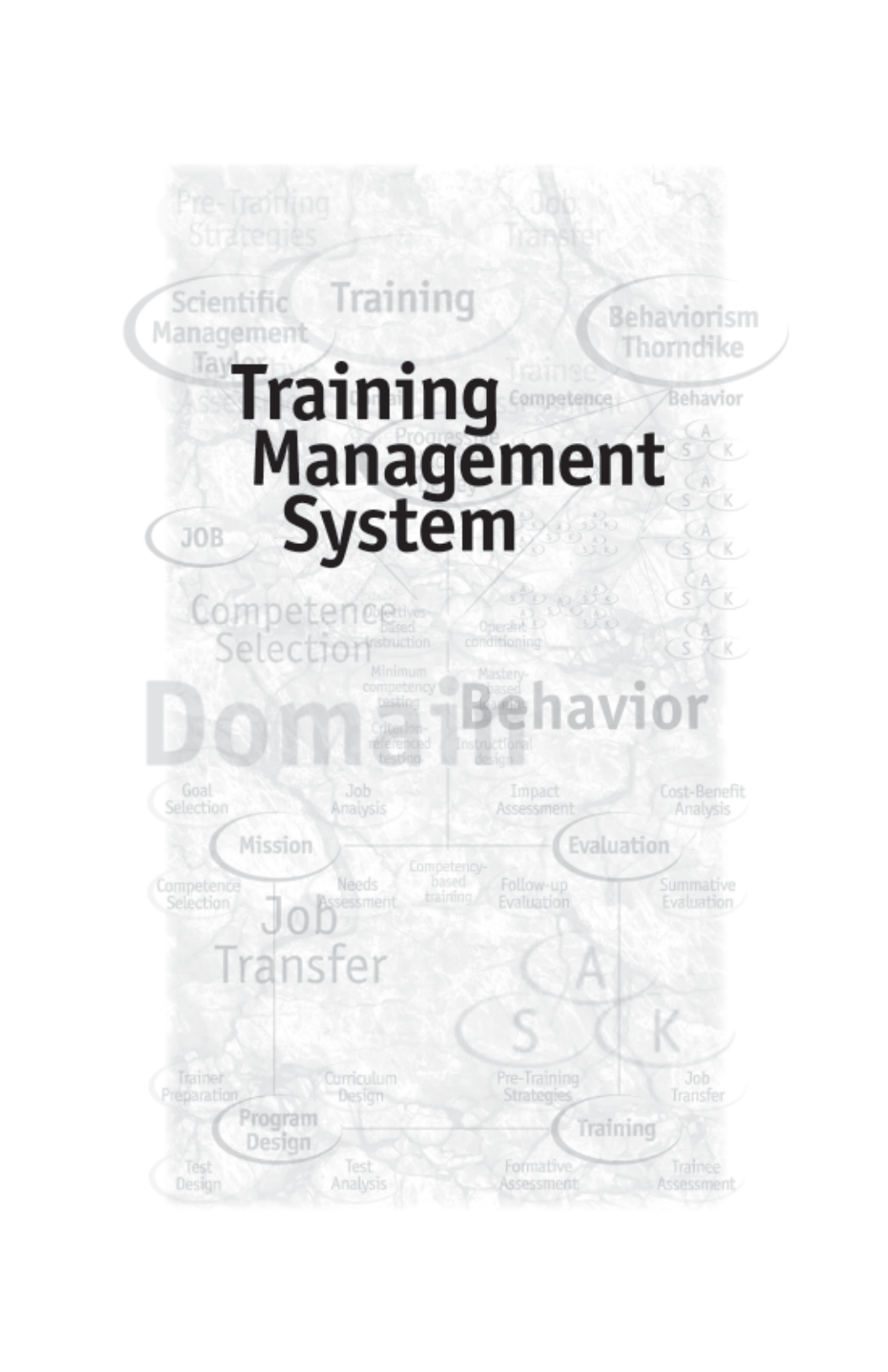


Training Management System

by

Richard J. McCowan


Training Management System
Pre-Training Strategies
Job Transfer
Scientific Management
Training
Behaviorism Thorndike
Competence
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Competence Selection
Domain
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Goal Selection
Job Analysis
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Cost-Benefit Analysis
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Trainer Preparation
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Test Design
Test Analysis
Formative Assessment
Trainee Assessment

Center for Development
of Human Services

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Introduction

Since 1980, the Center for Development of Human Services (CDHS) has provided high quality competency-based training (CBT) to social services agencies throughout New York State. These programs were based on needs identified in different ways including professional judgment, focus groups, and comprehensive, structured surveys.

During this time, CDHS developed a competency-based training management system which is "an integrated assembly of interacting elements designed to carry out cooperatively a predetermined function" (Gibson, 1960). For the past 20 years, CDHS used the system to manage program activities for a large university-based training organization that specializes in public-sector, social services training, primarily in New York State.

The concept of general systems theory was introduced in 1937 by Ludwig von Bertalaffy, a biologist. He concluded that mathematical models in biological, behavioral, and social sciences have similar structures and that based on these similarities, it was possible to develop a general theory to unify different scientific disciplines (Bertalaffy, 1968). Systems theory, therefore, is a set of interrelated principles that explains and predicts the behavior of people, groups, or organizations. A well-designed system is an orderly whole that clearly shows "the interrelationships of parts to each other and to the whole itself (Silvern, 1965, p. 1).

By relating common principles of different systems, systems theory improves communication and provides a holistic scientific approach. The major functions of systems theory are to:

investigate the isomorphy of concepts, laws, and models in various fields;

help make useful transfers from one field to another;

encourage development of adequate theoretical models in the fields which lack them;

> minimize duplication of theoretical effort in different fields;
>
> promote the unity of science by improving communication among specialists from different fields (Bertalanffy, 1968, p. 15).

Mesarovic (1964) noted that systems theory must be sufficiently abstract to encompass different types of specialized theories with concepts and terms defined in context at the appropriate level of abstraction. It must describe common features, but avoid specific aspects of particular systems. The system must clearly communicate how goals are achieved and describe interrelationships that exist among goals, procedures, and outcomes. A clear statement of systems theory clarifies assumptions about human behavior that underlie a program. It describes the measures needed to analyze program outcomes and establishes an iterative cycle of development, testing, and redesign (Scheirer, 1994).

In the early 1960s, systems theory dominated program planning and budgeting in industry and defense (Schlesinger, 1963; Wildavsky, 1964). It also exerted a significant influence on education and training. However, the term was not widely used until the space program popularized it with the words, "All systems are go!" At the present time, systems models exert a significant influence on training and education.

The CDHS model possesses the characteristics of a true system which focuses on the most important aspects of training:

> What should trainees learn that will improve their job performance?
>
> Have the trainees mastered the competencies on which training was based?
>
> How did training contribute to improved organizational performance?

The system is a complete model that begins with statewide needs assessments by job title with data collected from local agencies. Staff use these data to develop specific, needs-driven curricula. It includes computerized procedures to schedule training and produce evaluation reports at the state, regional, and local levels using a competency-based criterion-referenced evaluation design (CREST) (McCowan, McGregor, & LoTempio, S., 1983; 1984). The system includes comprehensive follow-up procedures to analyze transfer of learning at worker and agency level, and it provides remedial training for trainees who fail to master important attitudes, skills, and knowledge covered during training.

Competency-based training (CBT) must have the following characteristics:

Clear job descriptions and program outcomes

Needs assessments based on job-related competencies

Structured hierarchy of domains, competencies, and objectives

Posttest assessment of trainee performance compared with clear criteria

Remedial training and OJT mentoring to assure trainee mastery of essential material

Many programs, several of which are nationally prominent and well-regarded, are incorrectly promoted as competency-based training because they do not assess trainee performance. These programs have clear goals and objectives and curriculums linked to these objectives, but they are not competency-based if they do not assess trainee performance and provide supplementary instruction for persons who fail to master essential attitudes, skills, or knowledge. ***TMS*** is a complete system that collects evaluation data at the reaction, learning, behavior and results levels described by Kirkpatrick (1994) (see Table 1).

Table 1
Four Levels of Evaluation

Level 1 ***Reaction***	Evaluate how well trainees liked a program, typically using a questionnaire. Base items on job relevance, training effectiveness, and trainer performance.
Level 2 ***Learning***	Examine how well trainees mastered knowledge and skills included in training objectives. Typically, learning is measured by multiple-choice items.
Level 3 ***Behavior***	Evaluate program-related on-the-job performance. Assess change related to training objectives using questionnaires, interviews, or direct observation.
Level 4 ***Results***	Relate training to organizational objectives (e.g., reduction in costs or absenteeism; increased productivity or quality). Calculate cost/benefit or ROI (return on investment).

Level 4 assessment, which is based on results related to organizations objectives (e.g., cost-benefit, return on investment, or worker performance on the job), is seldom conducted, particularly in the public sector, primarily because of cost and accessibility to data. CDHS has conducted level 4 results-based studies. For example, a major study involves an examination of reports completed by a sample of approximately 400 New York City risk assessment workers who completed a 3-day training program conducted by CDHS. Copies of records completed by these workers will be evaluated by multiple raters, and these ratings will be compared to the posttest performance and supervisor ratings of the same workers. This process will determine if the posttest has predictive validity relative to on-the-job performance.

Phases of Training Management System

The CDHS training management system begins with job analysis as state and local agency staff collaboratively identify competencies that relate significantly to effective job performance. Successive phases flow from these competencies as training and assessment packages are developed and training programs are conducted. During formative evaluation, training practices are modified using data on trainee achievement and trainer performance. The complete process is illustrated in Figure 1, while specific procedures for each phase are detailed in Figures 2, 3, 4, and 5.

Figure 1
Mission

New York State Department of Social Services
Office of Human Resource Development

Training Management System

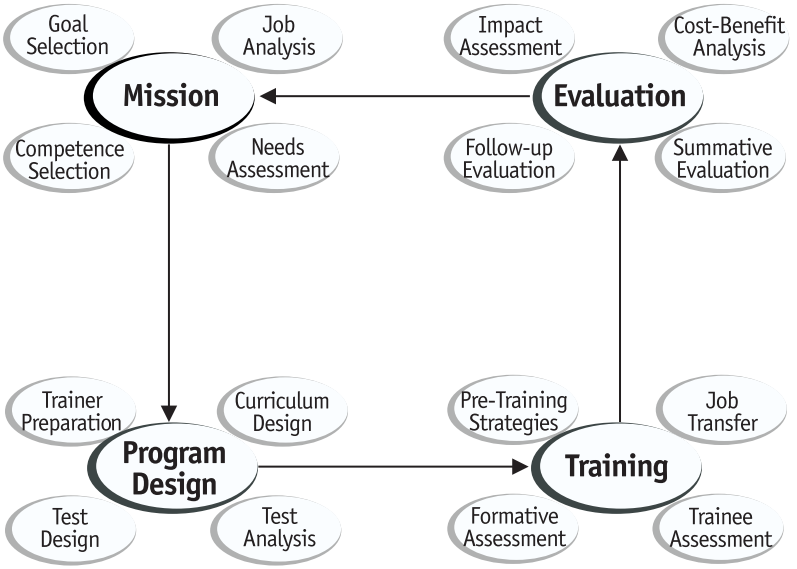
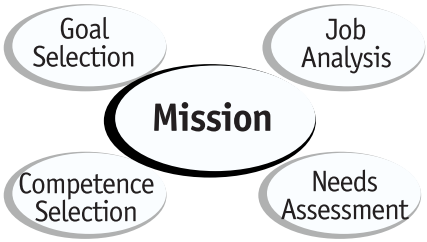


Figure 2
Mission Phase of *MTS*



Goal Selection	Job Analysis	Competence Development	Needs Assessment
Define program mission.	Obtain current job description.	Form competency development committee.	Design a competency-based needs assessment.
Define program goals and outcomes.	Examine job tasks and activities.	Identify domains.	Conduct needs needs assessment.
Describe performance requirements.	List job requirements.	Sequence domains.	Analyze needs assessment data.
Specify training needs.	Study behavior of competent staff.	Develop competency format.	Analyze performance gaps.
Identify existing training and support resources.	Examine job descriptions from other agencies.	Identify sources of competencies.	Identify trainee needs.
Identify program and staff performance constraints.	Analyze data fromother sources.	Train staff to write competencies.	Describe training program.
Select management staff.	Prepare competency-based job description.	Develop pool of competencies.	List available training resources.
Describe training alternatives.	Survey staff to validate job description.	Select relevant competencies.	Identify program constraints.
Assign staff responsibilities.	Interview agency supervisors to validate job description.	Edit competencies.	Select supervisory staff.
Describe needs assessment strategies.	Submit job description to panel of experts.	Sequence competencies	Select training staff.
Develop implementation plans for training system development.	Prepare final draft of job description.	List domains and competencies.	Describe training alternatives
Identify potential audiences.			Identify trainees.

The mission of an organization describes its basic societal function in terms of products and services provided for its clientele. The mission of CDHS provides the organization with a foundation for developing large-scale programs that provide high quality training for New York State human service workers.

As illustrated in Figure 2, the Mission phase includes goal selection, job analysis, competence development, and needs assessment. The process, which progressively moves from higher order, more general concepts to statements of greater specificity, is straightforward and logical. During the first step, management selects training goals congruent with the broad mission of the department. A goal, quite simply, is the purpose toward which an endeavor is directed. These goals are reviewed formally and informally by other managers, supervisors, and staff. Goals are modified and refined until a consensus is reached regarding their appropriateness. This process is conducted periodically to provide assurances that stated goals meet current, ongoing needs.

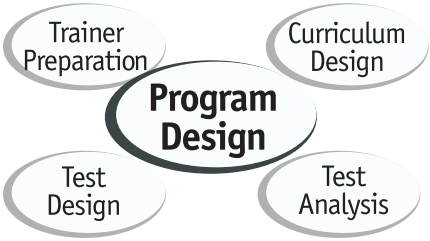
Job analysis begins with an examination of tasks involved in specific job titles based on Civil Service job descriptions and functional responsibilities. Descriptions for similar job titles from other agencies and organizations are collected and examined. Concurrently, supervisors study staff to identify behaviors that relate to competent performance. Information is collected from other sources including published research, program evaluations, staff and client focus groups, and staff performance assessments. This pool of information is used to generate a competency-based job description that is reviewed and validated by staff and supervisors. Their suggestions are incorporated in an edited version that is recycled through the review process.

Finally, a panel of experts review and modify the job description until it accurately describes competencies required for the job. For the purposes of training, the job description is based on competencies which are related clusters of specific attitudes, skills, and knowledge. These competencies are the basis for all subsequent training activities.

Needs assessment focuses on the gaps in performance which exist between competent and ineffective staff. Identified competencies are used as Likert items in the needs assessment. Individual staff members are evaluated by themselves and their supervisors on each competence based on level of skill and the relevance of each competence. Evaluators produce individual training needs assessments and group profiles from these needs assessment. This information is used to develop the training curriculum. The needs assessment phase includes preliminary activities related to training, such as selection of key staff and contractors and selection of potential trainee populations.

Program Design

Figure 3
Program Design Phase of *MTS*



Trainer Preparation	Curriculum Design	Test Design	Test Analysis
Describe trainer tasks and activities.	Design a curriculum model.	Describe the purpose of the test.	Field-test instrument.
List desired trainer competencies.	Specify learning conditions.	Form a test development committee	Obtain feedback after field-test.
Prepare trainer job descriptions.	Specify types of learning.	Describe the population to be tested.	Determine reliability.
Recruit qualified trainers.	Describe format of test items.	Develop format for objectives.	Compute index of item discrimination.
Assess competence and background.	Train staff to write objectives.	Estimate the number of items required.	Compute item difficulty.
Provide trainers with background information.	Write objectives for competences.	Develop an initial pool of item.	Determine mastery levels.
Brief trainers on program goals.	Sequence objectives.	Match items to competencies.	Revise test.
Provide practice opportunities.	Identify training activities.	Add items when appropriate.	Administer revised test.
Develop trainer readiness.	Adapt for adult trainee characteristics.	Complete item editing.	Reassess test.
Design a peer coaching program.	Develop training prototype.	Establish content validity.	Complete final revisions.
Observe trainer performance.	Field-test prototype and products.	Write instructions for scoring and administration.	
Provide enrichment opportunities.	Assess performance of field-test subjects.	Prepare table shells.	
	Modify training prototype.	Prepare draft of instrument.	

The Program Design phase includes trainer and trainee preparation, curriculum design, test design, and test analysis. Specific procedures for each of these steps are contained in Figure 3.

Trainer preparation begins when program managers describe trainer responsibilities. Consistent with the concept of competency-based training, the job description is based on competencies required for highly successful training. Much of the success achieved by the system is a direct result of recruiting highly qualified staff. Trainers have excellent academic credentials, as well as substantial professional experience directly related to job-related topics presented during training. Strong interpersonal and presentation skills are essential, as well as organizational support through supervision, training, and enrichment opportunities.

During curriculum design, goal-related competencies are refined into a more detailed level of specificity when training objectives (i.e., attitudes, skills, and knowledge) are prepared. This is a critical step because all training and evaluation materials relate to, and flow from, these objectives.

The level of specificity (i.e., unit of analysis) required for a training objective is an important issue which requires greater elaboration than can be provided in this monograph. However, the most important point related to this concept involves the job level for which training is designed. For beginning workers, training objectives are very specific and focus on entry level skills. For trainees at the supervisory and management levels, objectives become progressively more general and inclusive. Cognitive and educational psychologists have discussed this concept from different perspectives including "chunking," (Mislevy, 1993) "chaining," and "association" (Gagné & Briggs, 1974). Essentially, the concept implies that people learn complex tasks by mastering a series of specific skills required to perform the task. Once a complex task is perfected, it becomes a specific skill required to perform even more complex behaviors. For example, first grade children must recognize letters before they learn to read. As they mature, they master increasingly more complex reading skills. In a similar manner, the behaviors required for entry level workers differ in complexity from those re-

quired for supervisors. Likewise, the behaviors required of supervisors are less complex than those required for management level staff. As job level increases, competencies move to higher cognitive levels of analysis, synthesis, and evaluation.

A competency-based curriculum contains the entire range of directed experiences completed by trainees. Curriculum activities are highly structured and flow directly from the competencies and training objectives. Management and staff select the objectives on which training will be based, since in most circumstances training will not include every objective from the total universe of those available. As noted earlier, a competence is a cluster of related objectives, and each objective is a specific attitude, skill, or knowledge. Since the number of specific objectives is usually extensive, trainers select and sequence objectives on which training will be based and develop a prototype curriculum.

This monograph does not discuss techniques for writing specific instructional objectives because these have been described in other publications (Eisner, 1969; Gronlund, 1970; Mager, 1962; McCowan & Wegenast, 1996; Popham, 1969; 1990). However, protocols for writing objectives must be followed carefully because objectives form the foundation for all curriculum and evaluation development.

Test design and analysis flow directly from the objectives included in the training prototype. At this stage, the focus is on level 1 (reaction) and level 2 (learning). The first step is to describe the purpose of the test, after which a test development committee including both curriculum and evaluation specialists is formed. Before items are written, the committee considers the population to be tested and the types of items that will be used. Different item formats (e.g., multiple choice, open-ended) have different strengths and weaknesses. For example, multiple-choice items are easily scored and more reliable than open-ended questions, but less flexible in obtaining subjective, constructed responses.

After the committee estimates how many items are required to assess learning outcomes validly, committee members, trainers, and other content specialists develop an item pool. Items are matched

to training objectives which increases test validity and provides assurances that items truly represent content. Evaluation specialists edit items for consistency, validity, and appropriateness. The number of items selected per competence reflects the amount of training time devoted to that topic. Draft instruments are field-tested with persons comparable to those who will be trained. In addition to completing the test, these individuals will give unstructured feedback regarding the test. Based on this feedback and an item analysis, the test is revised and administered to a different sample. The recycling process continues until the committee determines that the test is sufficiently valid and reliable. After training begins, test items are scrutinized to determine if they are adequate for the assessment.

Training

Figure 4
Training Phase of *MTS*

Pre-Training Strategies	Formative Assessment	Trainee Assessment	Job Transfer
Collect baseline performance data.	Review evaluation data.	Administer pretest.	Develop a re-entry program.
Involve staff in program planning.	Observe selected training sessions.	Administer posttest.	Provide psychological support.
Orient staff on program goals.	Conduct trainee focus groups.	Assess cognitive gains.	Provide practice opportunities.
Describe why training is important.	Observe training sessions.	Assess attitudes.	Reduce initial job pressure.
Review program objectives.	Compare planned with actual procedures.	Examine ratings of competence.	Reinforce competent performance.
Encourage trainees to complete program models.	Identify difficulties encountered.	Examine subjective comments.	Provide role models.
Have trainees complete pre-training transfer activities.	Assess trainee interest in program.	Complete training report.	Reward successful performance.
Describe benefits derived from training.	Identify unanticipated effects.	Mail posttest results and remedial material.	Provide follow-up support.
Conduct the training program.	Analyze trainee performance.		
	Provide feedback to trainers and supervisors.		

Training is the most publicly visible component of the system. Figure 3 summarizes the specific procedures utilized during this phase. Pre-training strategies focus on trainee recruitment and selection. By describing potential program benefits, trainees are encouraged to complete the program. Trainees review pre-training background materials and complete pretests based on these readings and activities. Formal training ends as trainees complete posttests and contract for involvement in job transfer activities with supervisors or job mentors. After training, trainees receive reports that describe their posttest performance, including suggestions for improving performance on competencies which they did not master during training.

As training is conducted, formative assessment data are collected and this information is fed back into the system to improve and refine the program. The process includes formal and informal discussions and focus groups conducted by trainers and observations by supervisors. Program staff examine this information to determine if the actual training procedures match those that were planned. They also make appropriate modifications to improve practices that are less effective than they anticipated. Level 1 (reaction) data are collected using Likert items that examine specific aspects of training (e.g., trainer enthusiasm, quality of instructional materials). Level 2 (learning) assessment is accomplished by pretesting and post-testing attitudes, knowledge, and skills primarily with multiple-choice items. This information is used to prepare individual trainee reports described earlier, as well as reports described in the section on summative evaluation. Subjective comments that describe trainee reactions are also collected and sent directly to trainers for their review. Based on these comments, trainers refine their courses appropriately.

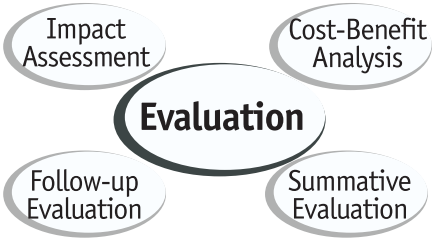
Job transfer is a critical aspect of successful training. Attractive, well-received training which does not improve job performance wastes time and resources. The model includes pre-training activities in which supervisors prepare staff by describing performance expectations that will result from training. Post-training activities include supervisors who engage staff in performance contracts, remedial training, coaching, mentoring, and formal training which

reinforces and rewards improved performance. This feedback maximizes the transfer of training and is an essential component of competency-based training. Supervisors also complete related training to improve their competence to work with staff.

Supervisors maximize job transfer by providing staff with psychological support and resources that support them as they practice newly learned behaviors. Management staff are in the best position to serve as role models and to reward and reinforce competent performance. Effective follow-up support during this post-training period contributes substantially to successful worker performance. Follow-up activities involve formative and summative evaluation strategies to determine which activities and job conditions promote transfer to performance.

Evaluation

Figure 5
Evaluation Phase of *MTS*



Summative Evaluation	Follow-up Analysis	Cost-Benefit Analysis	Impact Assessment
Complete data collection.	Determine procedures.	Describe program activities.	Match training goals with agency outcomes.
Analyze data.	Develop instruments.	Specify program limits.	Identify data sources for agency outcomes.
Compare data on selected variables.	Select sample.	Specify activity costs.	Assess transfer of training.
Mail individual trainee reports.	Develop database structure.	Identify non-monetary values.	Examine trainee performance data.
Mail group performance reports.	Conduct survey, interviews or focus groups	Identify program outcomes.	Survey trainee supervisors.
Interpret data.	Analyze trainee attitudes toward training.	Develop assessment measures	Assess trainee work performance.
Evaluate instructional products.	Analyze trainee attitudes toward job.	Gather data.	Assess impact on work unit.
Modify instructional products.	Analyze trainee attitudes toward clients.	Analyze data.	Assess agency impact.
Disseminate products.	Complete database entries.	Complete cost-benefit report.	Assess community impact.
Complete evaluation report.	Produce follow-up report.		Analyze outcome measures.
Disseminate evaluation report.	Disseminate follow-up report.		Complete report.
Revise training program.			Refine training based on report.

Figure 4 contains detailed procedures for the Evaluation phase. Summative evaluation is based primarily on data from pretests and posttests administered by trainers. Tests are developed and validated using procedures described earlier. Instruments include items on demographics, self-assessment of competence, attitudes towards training, and open-ended subjective responses. Before training begins, each participant completes a pretest which provides baseline data regarding performance on cognitive items based on the curriculum, as well as each person's self-assessment of competence in areas related to the training program. After completing training, each participant completes a posttest that assesses mastery for the total test and for specific content areas. Tests are produced using *Teleform w*hich creates a form which can be optically scanned using a conventional flatbed scanner. Staff scan data into a database and use *Microsoft Access* programs to produce nine different types of reports.

One of these reports is a "Trainee Report" produced for each participant. It lists content areas, mastery levels of satisfactory or unsatisfactory, and brief messages describing what the score means. An unsatisfactory performance level for a content area directs participants to review specific content from training materials distributed during training.

County DSS training directors receive copies of an *Agency Report* that lists agency workers who completed training, shows mastery status for each person for each content area, and pretest-posttest percentage improvement. Training directors receive copies of training materials, recommended assignments for content areas in which trainee performance was unsatisfactory, and training suggestions for related training activities. This report, in combination with the *Trainee Reports*, enables staff developers and supervisors to develop ongoing, individualized training programs to help caseworkers master attitudes, skills, and knowledge required for competent performance.

Additional reports based on trainee performance are produced for trainers, training supervisors, and state-level supervisors. These include the following:

Trainer reports contain a summary and interpretation of trainee comments. These include item analyses that describe how well trainees performed on each item. Evaluation staff meet with trainers as part of the formative evaluation process to improve deficient items and to determine if instruction should be modified to improve trainee performance.

Training organization reports summarize performance and attitude results for groups of trainees classified by courses completed, demographic characteristics, geographic regions, and agency. Summary reports show cumulative achievement of specific training units and trainees. Staff use this information for formative and summative evaluation, as well as for supervisory purposes.

State-level reports include copies of selected organization reports, as well as cumulative reports for similar training conducted by different organizations across the state. Level 3 (behavior) and level 4 (performance) data are collected during follow-ups of trainees and their supervisors. These follow-ups examine whether training helped staff master job-related competencies and whether their performance had improved after training. Follow-up, which focuses on how well training helped caseworkers perform more effectively on their jobs, is an integral component of the model.

Level 4 (results) data are collected during cost-benefit analysis and impact assessment. Cost-benefit analysis is "the process of adding up the cost, subtracting the costs, and choosing the alternative that maximizes the net benefits" (Gramlick, 1990, p. 2). In other words, how much money was saved by doing it this way? Assessing the amount of money saved by conducting training is a difficult, but essential component of the system. Unfortunately, the procedures involved in conducting cost-benefit studies are often costly themselves, and program directors are reluctant or unable to reduce training to fund such studies. However, if training programs devoted more money to research during the early stages of training until a judgment was made regarding the program effectiveness or ineffectiveness, better evidence could be assembled.

However, with proper planning it is possible to conduct well-designed cost-benefit research. Several CDHS studies provide models for this type of research. Floss (1990) compared the costs of an innovative HMO program and conventional care for Medicaid clients. A study in Erie County (McCowan, 1991) showed that clients preferred a lower cost managed care program to traditional services provided at the county level.

Impact assessment is the last step in the system. It focuses on transfer of training which is the effect of training on trainee and agency performance (Broad & Newstrom, 1992) and corresponds to Kirkpatrick's (1994) Level 4 evaluation. Data can be collected using surveys, focus groups, personal interviews, telephone interviews, and site visits, as well as from multiple sources including local agencies, summative evaluations, benefit-cost analyses, and impact analyses. This information is recycled by management staff during the *Program Design* phase as they plan new training cycles. Impact assessment is often limited by the same constraints which affect cost-benefit studies — namely, cost, time, and data collection difficulties, but it is possible to conduct this type of assessment.

CDHS conducts semi-annual follow-ups for the total population of trainees who completed programs during the preceding six month period using scannable *Teleform* instruments. In 1997 over 20,000 trainees and their supervisors were involved in these surveys. Each follow-up form contains the trainee's name, the training program completed, and dates of training, in addition to the following three questions rated on a 5-point scale ranging from "strongly disagree" to "strongly agree."

> "I learned specific, job-related skills and knowledge."
>
> "Since completing the training, I have used the skills and knowledge on the job."
>
> "This training helped me do my job better."

The survey includes from three to five additional questions based on specific competencies on which training was based. Trainees in-

dicate whether they used these behaviors effectively as a result of completing training, and their supervisors complete a similar form to rate the trainees on the same competencies. For example, the following items were used for *the FosterParentScope: Train the Trainer* program:

> "Have you used these behaviors effectively as a result of completing the training?"
>
> "Use FosterParentScope materials to develop training programs."
>
> "Develop workshops with consultants using FosterParentScope materials."

Trainees also indicate whether they would change, discontinue, revise, or offer the training in exactly the same format. They also complete the following open-ended questions:

> "In what ways did your agency support your use of these behaviors?"
>
> "What obstacles prevented you from using these behaviors?
>
> "Please make any additional comments you feel are appropriate."

Respondents mail the forms or fax them directly into a database, and CDHS produces reports using *Microsoft Access* programs.

CDHS has completed other impact assessments. McCowan and Wegenast (1989) used a Solomon 4-group pretest-posttest design to show that training had a significant, positive effect on the ability of caseworkers to identify and write specific objectives. Other research projects designed by CDHS will be completed in 1998. One study compared the effects of two different spend-down programs on low-income clients in two similar, contiguous counties. Another study used a time-series design to compare past, current, and future employment data to assess the impact of an employment initiative for clients on public assistance. A third study, described earlier, examined the impact of training on the performance of 400 New York City risk assessment workers.

Conclusion

The CDHS training management system is a set of practical, systematic procedures designed to manage and evaluate training programs. It is a complete model that meets the necessary criteria for competency-based training, namely:

Clear job descriptions and program outcomes.

Needs assessments based on job-related competencies.

Structured hierarchy of domains, competencies, and objectives.

Posttest assessment of trainee performance compared with clear criteria.

Remedial training and OJT mentoring to assure trainee mastery of essential material.

The system conforms to the criteria required for a system as described earlier in this paper. It integrates the complex procedures required to develop, deliver, and evaluate competency-based training. It provides a general model for a wide variety of different training and educational programs in the public and private sectors.

The system clearly communicates how its goals are achieved and clarifies the relationships that exist among goals, procedures, and outcomes. It describes how assessment measures are designed and utilized and provides an iterative cycle of development, testing, and redesign. It includes a full array of computer-supported systems to manage and report training data, ranging from the scheduling and planning of training through evaluation and follow-up at the reaction, learning, performance and results levels. Finally, the efficacy of the system has been tested and refined over a 20-year period in a large, statewide social services training program. Its procedures could readily be adapted to manage a broad spectrum of training programs both in the public and private sector.

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