T E C H N I C A L R E P O R T

STRATEGY FOR DEVELOPING A TRAINING CAPABILITY IN A WATER AND SANITATION INSTITUTION

A GUIDELINE

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by

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RELATED WASH REPORTS

Field Report No. 160. *Training Plan for the Water and Sanitation Component of SANRU II in Zaire*. April 1986. Fred Rosensweig.

Field Reports Nos. 177, 198. and 216. *Training of Trainers Workshops I, II, and III for the Water and Sanitation Component of SANRU II*. 1986-1987.

Field Report No. 126. *Establishing a Human Resource Development Unit within the Directorate of Sanitary Engineering (DISAR) in Peru*. May 1984. Hortense Dicker.

Field Report No. 194. *Training Workshop in Operations and Maintenance for Rural Potable Systems in Bolivia*. August 1986. Dan Edwards.

Field Report No. 202. *Training of Trainers in Operations and Maintenance for Rural Potable Water Systems in Bolivia*. December 1986. Dan Edwards

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ACRONYMS

A.I.D.	U.S. Agency for International Development
ESA	External support agency
HRD	Human resource development
O&M	Operations and maintenance
OJT	On-the-job training
RWDO	Rural Water Development Organization
RWS	Rural water supply

EXECUTIVE SUMMARY

Many people involved in the water and sanitation sector recognize the importance of training. Yet, there is often dissatisfaction with the quality and effectiveness of the training Some of the reasons for the inadequacy of training are the lack of understanding of the role of training, the lack of integration between training and management's agenda for the organization, and the lack of skilled training staff.

The purpose of this document is to provide guidance on how to develop an effective training capacity within a water and sanitation institution. The document discusses in detail what is involved in developing a training capability. Specifically, the document

- Defines the primary goal of training
- Describes the limitations of training
- Discusses what makes training effective
- Provides an overview and a definition of the essential elements of training
- Describes what needs to be done to develop a training capacity
- Defines the skills needed by staff to conduct good training
- Discusses some practical considerations in establishing and maintaining a training system

Training is defined in this document as a process for improving performance. It is described as a technology primarily aimed at adult learners. The purpose, methods and assumptions of training differ from those of traditional education. The educational process is designed to give individuals the tools for a "distant future" and for continued learning, as well as to develop knowledge through research. Training, on the other hand, is for immediate, specific job enhancement.

Training also differs from broader-based institutional improvement programs and human resource development. Institutional development seeks to strengthen organizational systems, procedures, structures, and management. Training seeks to change behavior related to job performance. An enhanced training capability is often one component of an institutional improvement program. Human resource development is the general category of activity

aimed at improving employee well being and satisfaction (benefits, long-term education, family support programs, staff incentive programs, career ladder and succession planning, and so on).

A central theme of the document is that the basis of all work-related training is improving job performance, but training may not be the only solution to improving performance. This document is devoted primarily, however, to how to improve the training function, but it recognizes that other solutions, such as better supervision, adequate incentives, availability of the right tools and equipment, and decent working conditions, are also critical in improving performance. Another central theme is that training can be an important management tool for motivating staff and improving organizational performance. Training is not an end in itself, but a service to the institution as a whole.

To be effective, training must be

- Designed according to the principles of adult learning theory
- Based on a correct needs assessment and applicable to performance needs
- Appropriately targeted
- Designed correctly to achieve the desired outcomes
- Delivered using participatory training methods
- Conducted by skilled trainers
- Well managed, planned, and coordinated
- Evaluated and improved

This document discusses a number of important considerations in starting up a training function, including the following:

- Creating a vision for training within the institution
- Involving key supervisors and top management
- Determining the structure and size of the training department
- Determining the cost of training

- Getting the right staff for the training department

In general, the document is intended to provide guidance for project planners and for senior managers in a water and sanitation institution on how to develop an effective training capacity.

1

INTRODUCTION

1.1 Objectives of Guideline

This document is intended for development planners working in donor/lender organizations, such as the Agency for International Development (A.I.D.), the World Bank, the United Nations Development Programme, and other external support agencies (ESAs). It is also intended for national-level ministry planners and agency staff (utility managers) interested in developing a training capacity either in urban utilities or to support rural water supply systems.[1] Project developers intending to include a training capacity in a project design should also find this useful. Finally, consultants and training professionals involved in developing training systems could use this as a resource document.

The following major objectives are addressed in this guideline:

- Define the primary objective of training.
- Describe the limitations of training.
- Discuss what makes training effective.
- Provide an overview and a definition of essential training elements.
- Describe what needs to be done to develop a training capacity.
- Define the skills needed by staff to conduct good training.
- Discuss some of the practical considerations in establishing and maintaining a training system.

[1] Training departments and institutionalized training capacity are primarily found in urban water supply systems (utilities). This is because most rural water supply is structured to be supported by local communities under the general institutional oversight of governmental ministries, which seldom are able to provide a permanent training capacity for dispersed rural villages. Rural water supply training is often provided within projects funded by external support agencies. This usually does not extend beyond the project period, but there have been instances in which a specific responsibility for rural water supply and continuous training is provided for and assigned to one agency. Examples for setting up training in this situation are provided, along with a decentralized (provincial) example, in Appendix A. All assumptions about the purposes and methodology of training discussed in this document apply equally to rural and urban water supply. The context and the organizational structuring of rural water supply, however, differ from those of urban systems. These differences are explained in Chapter 4.

1.2 Why This Guideline Document Is Provided

In most donor-assisted countries, the water and sanitation sector is facing a training or skill-deficiency problem, which has serious consequences for job performance and service to consumers. Responses to the problem run the gamut from no response to developing complete training systems. In practically all A.I.D.-assisted countries, however, there is also a need to develop a training capability or to improve the current capability. This guideline is designed to help define what has to be done to build or improve the training capacity in water and sanitation institutions.

1.3 Why Are Skilled Staff in Short Supply?

The need for skilled staff in the water and sanitation sector in developing countries is partially due to the lack of overall manpower planning and human resource development in ministries and utilities and to the nature of staffing in the sector. In developing countries, utilities are usually managed or supervised by engineers, as contrasted with utilities in Europe or the United States, where chemists, technicians, business-oriented managers, or technical school graduates attend to water supply and sanitation (except in the very largest systems, in which there is a technical role for engineers). In developing countries, appropriately trained engineers-managers are in short supply. Technicians in skilled trades, such as mechanics, electricians, and shop repairmen, are also in short supply.

Given the staffing pattern of engineers-as-managers, traditional educational institutions should produce appropriately trained engineers and technicians. Water and sanitation organizations, for their part, should work with the educational institutions to ensure basic training for manpower supply. Unfortunately, seldom is there even a line of communication between service-providing organizations and traditional sources of manpower supply, much less effective coordination.

The relatively recent emergence of piped water supply and sanitation on a large scale in many developing countries accounts, in part, for the overall shortage of skilled staff. Increasing numbers of people to be served in continuously expanding populations also contributes to the need for more trained staff.

The issue is further complicated by the lack of a clearly desirable, well-paying professional demand on the market side of the equation. As a result, sanitary engineering is rarely the first choice of promising engineering graduates in developing countries because the pay is low and the sector is usually managed by inefficient public organizations. Given employment alternatives in civil, structural, or highway engineering, most student engineers prefer to study those specialties. Employment follows opportunity, and engineers often work in water and sanitation only as a last choice. Consequently, new engineers come into the sector with little training in water and sanitation systems, and they need specialized training before they can

perform the tasks required. This is also true of technicians and skilled workers, who more often than not learn on the job and work their way up through the ranks.

Manpower supply affects supervision and management as well. Underskilled individuals often move into key positions of supervision and management and are able to provide little guidance to technicians and water plant operators (who perform the greater part of water supply construction and operations). Engineering training, if at all focused on water supply, usually deals with design theory and hydraulics rather than the practical aspects of system construction and operations and maintenance. Engineering training seldom includes management principles or utility management. Consequently, training is often needed all down the line, from management, to construction supervision, to the plant level for operations and maintenance.

In rural water supply systems, a different set of skills are needed and the task of creating the capability to meet those needs is complicated by the fact that sectoral arrangements seldom provide permanent agency structures to support rural water supply. Rural water supply is given a low priority or is often treated as a transitional stage toward urban or peri-urban water supply. Projects specifically designed to strengthen rural water supply, however, frequently provide training for community management, caretakers, and operators. Training is also needed in project promotion, hygiene education, community organization, and community-based operations and maintenance. This often is not continued after project funding stops, however.

1.4 Why Has Training Capacity Been Inadequately Addressed in the Sector?

Although training is expected to address a range of skill deficiencies, few truly adequate training systems exist in developing countries. Much traditional training is ineffective, and because effective models are rarely followed, training remains undervalued. A variety of reasons contribute to inadequacies in training capacity:

- Lack of understanding of the role of training.
- Lack of commitment to training.
- Lack of funds to provide training.
- Lack of integration between training and management.
- Lack of skilled training staff.

Although these deficiencies are especially prevalent in newly developing national programs, they also exist in countries where water supply and sanitation agencies have existed for many years without addressing human resource development needs. As service-delivery organizations are created, grow over time, and become institutionally complex, the need for concomitant skills and knowledge, and hence training, also increases. This resource document addresses these issues and provides guidance on how to deal with them.

2

DEFINING TRAINING

2.1 Purpose of Training

The purpose of job-related training is to improve staff performance. Thus, the skills and knowledge taught in training programs should help employees meet the current performance standards of the organization. Unfortunately, few organizations in developing countries have established performance standards. To be effective, training must first help define those standards.

Training is provided to change human behavior. Creating behavioral changes is a complex process, however, one not fully appreciated by the casual observer. It requires specialized skills related to both the function of training and the subject areas to be covered by the training. In the water and sanitation sector, training needs vary over a large range of skills. Sophisticated urban systems with automation and instrumentation, pumping, and complex treatment procedures require a different set of skills from simple rural, gravity-flow systems. The administrative skills required depend upon the degree of commercial orientation. And if a program is largely rural and integrated with health education, training may cover such topics as community organization and hygiene education, and it may be targeted to community people, as well as the staff of the service-providing organization. Training must address the goals of the particular institution.

Training, then, seeks to improve the way people carry out work by providing the skills and knowledge that are lacking. Training also provides information (in orientation-type activities) needed to carry out work. Training may not, however, be the only solution to improving performance. At times, other solutions may include better supervision, adequate incentives, availability of the right equipment, and decent work conditions.

2.2 Role of Training Compared with Traditional Education, Institutional Development, and Human Resource Development

The purpose, methods, and assumptions of training are different from those of traditional education. Traditional education is, by definition, designed to prepare individuals for a future life. Educational institutions are designed to lay a foundation for future application and learning. The recipients of traditional education normally range from children to young adults. Training, by contrast, seeks to provide specific skills and knowledge that can be applied immediately to work situations. The learner is usually an adult with life experience, a foundation of skills, and an adult perspective. The methods often used with children (teacher control, rote learning, and instilling discipline and learning habits) are

counterproductive with adult learners, who have already passed into a stage of autonomy and self-discipline. Training seeks to build on adult experience and the mature perspective. It uses methods that actively involve the adult learner in "discovery" learning. Training requires two-way communication processes (such as small discussion groups and practice-with-coaching sessions). The aim of adult training is to provide quick results. Responsibility is thrust on the learner Training is designed to involve participants in active learning tasks that use their experience. The instructor acts on a collegial level rather than as a superior. His or her job is to facilitate the learning process.

Neither is training the same as institutional development. Broad-based institutional improvement programs go far beyond the limited scope of training. Institutional development seeks to strengthen organizational systems, procedures, structures, and management. Training is aimed at changing behavior related to job performance. An enhanced training capability is often one component of an institutional improvement program.

The final distinction to be made is to relate training to the broader category of human resource development (HRD), the general category of activity aimed at improving human performance This includes employee well-being and satisfaction (benefits, long-term education, family support programs, staff incentive programs, career ladder and succession planning, and so on) as well as training and long-range HRD planning. Training may be provided as one part of the HRD package of an institution. HRD managers in organizations often arrange or manage training for employees. Sometimes a training department is structured under the umbrella of the HRD division or office. But training is a method and a process with a more limited goal than HRD.

2.3 Defining Performance, the Basis for Training

Performance is a complex issue. As a concept, it is understood by behavioral scientists to describe the actions that take place to achieve a specified result in the work setting (or whatever setting is under consideration). Performance as a concept differs from motivation, causation, or the internal "reasons" that may prompt an individual to choose one behavior over another. In training, the study or analysis of performance simply attempts to describe actions (what an individual does, how fast it is done, how correctly, if it is not done at all and should be, if it is done too often, and the like). The analysis of performance in its purest form does not attempt to determine why an action is done in a particular way.

> **Performance, then, is primarily a measure of how a job is done both qualitatively and quantitatively.**

The study of performance, however, must consider contextual variables that may explain poor performance or help define what is needed to improve performance Contextual variables include such factors as clarity of task and job, clarity of communication about what

is expected as a task, work conditions, equipment availability, supervision, and previous work experience and training.

2.4 Performance as an Issue across Cultures

Performance is defined culturally. What is acceptable job behavior in one setting may not be acceptable in another. Such things as work habits, attention to detail, and degree of discretion in taking initiative or making decisions tend to vary from one part of the world to another and, within broad geographic regions, by country and even areas within countries. The challenge of training is to find a way to relate the cultural norms to acceptable standards for performance.

As an example, performance is considered in North American and European cultures as a measure of what an individual does in terms of work output and attitude toward the work. The values of efficiency, cost-effectiveness, attention to proper written procedures, and high motivation are considered ideal in these product-oriented, business-proficient settings. When these values are transferred to developing countries without taking local values into account, however, problems often are encountered. Performance as a concept, if defined solely according to Western values, is often considered intrusive, unfriendly, cold, and insensitive in many traditional cultures, particularly if they do not have a strong private sector orientation or have not adopted production-oriented norms.

In contrast to the Western approach, dealing with performance in many traditional Asian countries requires sensitivity to "face." This is because the essence of the individual (the "being") is considered sacred (connected with and a part of divinity on one level). Therefore, any observation or comment about what the individual *does* as a human actor can be considered a violation of his or her privacy, or divine right as a manifestation of a higher being or force. Actions and being are thus commingled. Consequently, to comment on, correct, improve, or treat behavior without following respectful procedures is a violation of the sacredness of the individual. Performance feedback must be very diplomatic and indirect (through example) if it is to be useful or understood in this situation.

In recent years, modern businesses in some Asian countries have moved away from this traditional interpretation and have successfully addressed performance directly. They have set up clear expectations for performance before conducting performance reviews and have established an organizational norm that performance review is part of the job requirement They make it clear that performance is within the domain of work and not the private reserve of the individual.

In Latin America, there is a strong emphasis on the maintenance of the social system within the workplace. A well-performing organization pays attention to maintaining the social environment. A good performer is able to maintain friendly relations with peers. The

assumption is that harmonious working relations in a good work environment are very important. Under those conditions, the work will also be accomplished.

When training attempts to intervene and treat performance issues without taking into account the social and motivational factors of the culture involved, resistance can be encountered from both management and the trainees.

2.5 Performance as an Organizational Issue

Performance, in addition to having a cultural dimension, usually has an organizationally determined dimension. Organizations have either implicit or explicit norms for behavior. Certain kinds of behavior are rewarded, praised, ignored, or noticed and vice versa. Performance standards are often not defined in formal ways and are consequently unclear, or "assumed." They should be made explicit and be understood, however, whatever the cultural setting. When they are, training is more effective, and staff are much easier to manage because they understand the rules and standards by which they are judged.

2.6 Training as a Management Tool: What Training Can and Cannot Do

Because improvement or change in skills and knowledge helps individuals and an entire organization do a better job, training is often referred to as a management tool or instrument. A manager who knows how to use training and has a training capability available can motivate staff, get results, and improve performance. Training can make a manager's job easier, particularly if he or she has staff that, due to skill deficiencies, require a lot of time for coaching and close supervision. This is true at the unit level as well as on the larger organizational level. Staff feel motivated when they know that management cares enough about them to invest in them as a human resource. Training is a way of maintaining human resources.

> **Training is a process of changing work-related behavior that is within the primary control of the employee.**

Using training as a management tool requires an appreciation of what training can and cannot do For example, if pump operators do not know how to do routine maintenance, training can teach them how to do it. If a community administrator of a water board does not know how to keep simple records, training can provide him of her with the necessary skills.

Training, however, cannot improve poor performance caused by problems that are outside the employee's control. For example, training cannot provide adequate tools and equipment

at the work site, nor redesign inappropriate physical works. Nor can it change adverse personnel policies, such as low pay and inadequate incentives, or other organizational problems.

Training is a powerful tool that management can use to improve organizational performance. Training cannot, however, directly change policies. Because a properly conducted training analysis investigates performance problems before a decision is made about whether and how to treat them (see section 3.3), it can provide management with valuable insights about larger performance issues. A training analysis should be done in conjunction with a supervisor or involve the supervisor so that he or she is made more aware of the causes of performance problems. For example, after an investigation of a performance problem the following observation might be made: "The pump operators have all the skills they need to do their jobs, they just are not motivated because they feel they are treated unfairly by the organization; they say they are not given clear directions by their supervisor and have equipment that is poorly designed to do the job." This information can then be used as a basis for other actions, such as changing policies or procedures.

Training also seeks to improve the quality of a product or service. How employees accomplish a job in terms of the amount of time they require to do it, the attitude they have about it, their precision or lack of precision in carrying out a task, their ability to anticipate and solve problems, and their overall contribution to quality in output are all issues of performance and become the task of training.

Training can also be directed at improving supervision and management. Often performance problems of the line staff are caused by poor supervision. For example, sometimes managers and supervisors fail to provide direction, delegate appropriately, or communicate clearly with staff. If training tries to improve the behavior of workers without improving supervision in such situations, it often fails. Thus, assessing the training needed requires a careful determination of the causes of the performance problems.

3

WHAT AN EFFECTIVE TRAINING SYSTEM DOES

Listed below are the major elements of an effective training system. Effective training is

- Designed according to principles of modern adult learning theory
- Based on an accurate needs assessment directed to performance problems
- Appropriately targeted
- Designed correctly to achieve the desired outcomes
- Delivered using participatory training methods
- Conducted by skilled trainers
- Well managed, planned, and coordinated
- Evaluated and improved.

The conceptual underpinnings of each of these elements are discussed in this chapter. Chapter 4 then shows how an effective training capability is developed on the basis of these elements.

3.1 Effective Training Is Based on Modern Adult Learning Theory and Practice

Over the past 30 years adult education and the psychology of learning have advanced as a body of knowledge. Traditional models of training were based on the apprenticeship models that existed in guilds and family enterprises during medieval times. Although the modern approach is to accelerate the learning period for a job, compared with a 5- or 10-year apprenticeship, many of the principles of apprenticeship (e.g., "learning by doing" and "coaching") apply to modern training.

Because of its apprenticeship roots and the experience of training practitioners over the past 30 years, training is distinguished from formal, or traditional, education (refer to 2.1.1 above). Training is designed to teach adults how to do a job or to enhance the foundation

of skills and knowledge they already have. Formal education prepares young people to enter society and/or develop professional skills.

The modern study of training is considered the study of how adults learn (adult learning). It is called androgogy (*andro*, adult, from the Greek root; *gogy*, the root for learning) as opposed to pedagogy (*peda*, child, from the Greek root). This term has been popularized by Malcolm Knowles with his text *The Adult Learner* (see Bibliography, Appendix B). The point is that educational methods often used to teach children (lectures and memorization) are not effective or appropriate for adult training (lectures and rote learning are not very effective for children either). Adult training is a specialty in its own right, quite apart from formal education. The methods are different, and being a trainer requires a strong foundation in adult learning methods.

As applied to the practical concerns of developing a training system, a few important principles stemming from modern adult educational theory should be adhered to for a successful training operation. Perhaps the most important is that adult learners must be treated differently from child learners. This is true in several ways:

- In the amount of *control* adults have over their own learning. Adults are mature and autonomous beings, they resist being talked down to and will turn off learning when forced to be dependent. Adults learn better when they find ways to "teach themselves." This is sometimes called "discovery learning."

- In the need for *immediately applicable* learning for the job. Adults are not particularly interested in waiting for some future application of learning after "graduation"; they want to learn useful skills that can be put into practice right away.

- In the amount of *life experience* and skills they bring to training. Adults already know a great deal; they bring that with them and can use it as a foundation to build on in training.

- In the use of *interactive and practical training methods*. Well-designed training allows adults to almost teach themselves and each other. The autonomous, creative, and empowered adult learns best when challenged with training methods based on *discovery learning*, such as exercises and field work, in contrast with commonly used methods, such as repetition, one-way communication/lecture, and instructor-centered methods.

Modern adult educational theory incorporates research from a cross section of the social and behavioral sciences. Training specialists should be versed in many of these adult-learning concepts, including the following:

- Learning theory, used particularly in criterion-referenced training (applied to technical training primarily).
- The study of groups and human change.
- Studies of the role of motivation and leadership in human behavior.
- Studies of communication.
- Management sciences and organizational systems theory .

From these theoretical roots, a variety of very practical and effective training methods have been derived and improved over the past several decades (see section 3.5). Modern training departments know how to use adult learning approaches, and the training specialists on the staff are prepared in adult learning theory. Training has moved far beyond the days when it was sufficient to let new staff work alongside more experienced staff until they somehow magically acquired the skills of the experienced. Training is now its own specialty

3.2 Effective Training Accurately Assesses Training Needs

The chain of events leading to training often starts with someone, usually a supervisor or a manager, but sometimes, embarrassingly, an important politician or consumer, observing that a performance problem exists: "The water treatment plant produces unsafe water ... 70 percent of the meters are broken ... there are too many construction flaws and we can't turn over the system ... bills are 75 percent incorrect and three months late." Or, a performance problem is anticipated: "We cannot promote and construct rural water systems if community water boards and local operators do not know what a water system is and how to maintain it." From this initial identification of a problem and the sense of priority that decision makers in an organization attach to it, a request is often made to a training department or whoever is responsible for training to correct the problem or avoid a potential problem.

Before behavior can be changed, however, it is necessary to know what is being changed (the current behavior) and the desired results (the future condition after training). In order to make this determination, an initial needs assessment is conducted. This is most effective when the needs assessment involves several individuals and includes supervisors; it is particularly important that the training staff not pose a threat to supervisors. The procedure usually requires interviews and observation of work in progress, talking with supervisors and

top management in an effort to determine if training is the answer to the performance problem, and deciding how to conduct the training if it is. Sometimes written surveys are used to obtain a rough indicator of training needs as well.

The initial needs assessment is supposed to pinpoint the problem. The causes of the performance problem should be analyzed and broken down into skill and behavioral deficiencies as distinguished from factors outside the employee's control. This is not an easy task. Observable behavior only demonstrates what someone does; it does not tell the observer why As discussed previously, training is the answer to the problem if the deficiency is within the control of the trainee, that is, it is a skill or knowledge deficiency. If another reason is at the root of the problem, that should be determined and referred to top management or dealt with in some other appropriate way.

In the process of conducting a needs assessment, the trainer also must find out what constitutes desirable performance. It is helpful in this process if performance standards have been developed and communicated to the future trainee. If not, it becomes a part of the trainer's job to work with management to determine performance standards and then to communicate them during training. Once it is clear what the current performance and the desired performance are, the discrepancy between the two, often called the training gap, can be identified and training designed to overcome it.

Effective training departments continually interact with the work environment, supervisors, and management to learn what performance problems exist. This interaction requires an active partnership with management. Usually, many performance issues exist at the same time and they evolve over time as staff come and go and the service and products of the organization change. The training function requires close interaction with top management to ensure that the organization's priorities and needs are accurately reflected in the training program.

3.3 Effective Training Is Directed to Those Who Need It

The training department (with managerial concurrence) should determine who should attend a program, advise management on how many people need training, and determine the appropriate size and location of the training program. This information should inform the process of planning and budgeting for training well before the program is conducted.

The training department should also ensure that those who need training attend. This should be a collaborative process between the training department and management. When this is not the case, people may attend training who do not need it and those who should attend training may not be sent. This point should be apparent, but people often are sent to training for the wrong reason (e.g., as a punishment or a reward) or repeatedly attend training as a means of earning incentive pay. One way to avoid this is to set up a training

information system that tracks individual attendance and requires a clearance procedure for attendance.

3.4 Effective Training Is Correctly Designed to Achieve Desired Outcomes

A training department must have the capability to follow sound training program development principles. As described above, the first step is the needs assessment procedure, which determines what the outcome of training is supposed to be. From this, training objectives are formulated. Achievable, relevant training objectives are statements of qualitative, measurable, and desirable performance. They specify what people will be able to do when they successfully complete training.

Once a clear set of training objectives has been established, the next step is to develop a series of learning activities that will lead to the desired outcomes. The training designers should take into account the principles listed above (section 3.2) and design a program with an appropriate mix of training methods (described in section 3.5). The training plan is written into a trainer's syllabus or instructional manual, usually called "the training design." The design contains all the written instructions a trainer needs in order to deliver a training session. It usually takes more time to create a good training design than it does to conduct the training session. This is especially true the first time a program is developed.

The training design is organized by training sessions, each of which is divided into a series of timed activity blocks. The objectives of the training session are usually presented on the first page of each training session design. This is followed by activity descriptions, which specify the allotted time and content of the activity and provide instructions for group activities, exercises, handouts, lecture notes (content talking points), instructions to be put on flipcharts, and even the questions the instructor is supposed to ask to help the trainees reflect and learn from the training exercises. For training programs in a complex content area (e.g., water meter repair or maintenance of chlorinators), the entire program may include a number of sessions spanning several days. A training syllabus of this nature will form a booklet for the instructor (an instructor's manual) comprising, perhaps, a hundred pages of material if the handouts and other trainee materials are included.

Instructor manuals are important elements of a professional training effort. They provide a means to ensure that training is consistent, well conceived, and targeted to anticipated outcomes and that quality control is exercised in the design and delivery of training.

3.5 Effective Training Uses Modern Adult Training Methods

The methods commonly used to train adults are varied, involving, and interesting. A great number of effective methods and devices have been developed over the years. These include hundreds of specific applications that follow a core of basic adult training methods (see accompanying figure). For a detailed presentation of the variety of methods used, refer to Appendix C. The summary presented here is organized according to a continuum of learning complexity that ranges from manual skills to higher level conceptual and cognitive skills. Each method has a specific application to a learning situation or need, although some methods can be used effectively for more than one type of training. Effective training organizations know how to match training methods to learning needs. All adult training methods are designed primarily for interactive processes between the individual and the group, or the individual and the trainer.

3.5.1 Manual Skill Methods

Methods in this category are used primarily for technical skill and industrial or vocational training. Some of these methods are also used for such skill areas as bookkeeping or public speaking. These methods are the most traditional ones used in training. They are directed at acquiring physical skills or learning routine procedures, for the most part. These methods incorporate a great deal of trial and error in their methodology.

3.5.2 Information Transfer Methods

These methods are designed to transmit information, either in written or verbal form. In adult training, the element of "discovery" is incorporated in these methods so that the learner is in control of the learning process as much as possible.

3.5.3 Concept Development Methods

These methods are designed to engage the participant in thinking-while-doing. A primary objective in these methods is to require that the participant examine concepts, ideas, and assumptions and perhaps acquire new ideas in the process. The methods tend to be somewhat more analytical (cognitive) than physical (psychomotor). In the adult learning setting, many of these methods are used in conjunction with small groups of people working together, with the exception of written exercises.

3.5.4 Higher Level Skill and Attitudinal Development Methods

These methods are designed to require an integration between thinking and doing; they are skill oriented and deal with the formation or modification of concepts and beliefs. These methods are used frequently to influence or challenge attitudes. They combine elements of simulation, problem solving, coaching, skill practice, and trial and error.

3.6 Effective Training Is Conducted by Staff with the Appropriate Background and Skills

It is important that a training department have good trainers. A mix of training specialists and content or technical specialists is highly recommended. The training specialists should guide the management and delivery of training and oversee the training function; the technical specialists, skilled in the subject matter or skill, should conduct the training. In some situations, training specialists may also be subject matter specialists. This is frequently the case for management training, many "process areas" of training (e.g., communication, problem-solving), and orientation programs. Occasionally, technical specialists can become training specialists if they receive the appropriate training. One strategy is to select the best technical specialists to serve as trainers for a period of time on an ad hoc basis.

Anyone who conducts adult training must learn how to use adult training methods sufficiently to work with adults. This should be the case even when a technical specialist works in tandem with a training specialist.

A training specialist must be able to do the following:

- Assess training needs and determine which needs can be met through training.
- Develop training curriculums to achieve the desired outcomes.
- Design and develop training materials.
- Deliver training in front of groups using a range of adult training methods (group process and facilitation skills).
- Evaluate training.
- Manage and coordinate training events and the training department.

A number of personal qualities and personality characteristics are important for the effective delivery of training. More is required than knowing the subject matter or having the skill.

Some individuals are better communicators than others; some help others learn in a nonthreatening way and some do not. A trainer's personality characteristics are as important as his or her knowledge. Training requires a great deal of effective communication and the intangible quality of establishing credibility and inspiring confidence in others at the same time. The ability to listen, explain, illustrate points with examples, be relaxed and humorous, be accepting and patient are all important personal qualities for any trainer.

3.7 Effective Training Is Well Managed

The management of training, in principle, is much like the management of any project area or functional area in an organization. The general rules and concepts of management for achieving the desired outcomes apply in each situation: planning, budgeting, arranging and organizing, staffing, and evaluating. Effective training management can be broken down into those elements that must be considered to ensure that the overall training function is performed smoothly and that the particular requirements of a specific training event are taken care of. The following discussion briefly describes the major management elements that must be considered for the training function.

3.7.1 Planning

The most important part of planning for training is "to have a plan in place " One must be able to anticipate over several months or a year what training will be developed and delivered. Training is delivered in "cycles" (needs assessment followed by design followed by delivery followed by evaluation, which feeds into a new needs assessment and the cycle is repeated). The planning process should enable a training department to set up a yearly calendar of training events (master calendar). Some training curriculums may be repeated every year or more frequently because a recurring need in the organization exists. Other training may be designed to meet a special problem area or need and may not be repeated until the same problem arises again. Recurring training is often termed the "core curriculum" in a training department.

An essential part of planning for training is to have the information required for planning· who, what, when, how many, where, how much. Modern approaches to planning for training increasingly have moved toward developing a training information system as part of the overall management information system. This may be computerized, particularly in large organizations In the water and sanitation sector, the information system provides a data base on the current performance of individual plants and performance indicators for the different products and procedures, such as billing and collections, time required for repairs, connections, complaints, and personnel data (e.g., number and location of staff, attendance in training). With performance indicators in the data base, it becomes possible to measure

changes in plant performance and staff performance. It also becomes possible to assess whether training makes a measurable difference in system performance.

3.7.2 Budgeting

Deciding what resources are needed for the training department requires that the overall training plan be detailed enough to anticipate costs. Budgeting is made much easier if the training plan is formatted by the chronology of training events, each of which is broken down into such line items as materials, equipment, staff time required (permanent and consultant), trainee costs (travel and per diem), space requirements, and training overhead (essential permanent equipment, support staff, recurring office costs). By basing a budget on training events and considering all overhead factors, it becomes possible to calculate the average cost per trainee per training day. With this information, management can address the question, Can we afford to do this training? Or conversely, Can we afford not to do this training? Some agencies have a policy of allocating a percentage of personnel costs and then prioritize needs based on the amount of money available.

3.7.3 Staffing

Getting the right staff to conduct training is important. In the earlier discussion of the skills required of trainers (section 3.6), it was suggested that a mix of training specialists and subject matter (or technical) experts is a good combination in many instances. In Chapter 4, the relative merits of different staffing strategies for the training function are discussed.

One of the keys to an effective training department is an effective leader. Training departments should be managed by a senior human resource development specialist. This person should be selected for the position not on the basis of technical or engineering background, but on the basis of knowledge of human resource development. If the position is designed for a senior person, then the training department will have access to the other senior people in the institution. This access will tie training activities more closely to the overall goals and operation of the institution. It will help in coordination with the personnel department as well as the technical departments. The head of the training department should be knowledgeable about the following:

- Needs assessment
- Technical planning
- Technical skills training
- Management training

- Personnel recruitment and selection
- Budgeting and resource planning
- Benefits and compensation

Although two of these areas, recruitment/selection and benefits compensation, will not be the direct responsibility of the training department, they affect performance of staff so directly that the head of the training department should understand the issues.

3.7.4 Organizing

Management of the micro environment of training requires attention to logistics and detail if training is to be conducted without distraction and delay. The essentials of good organizing are discussed below.

Appropriate physical environment/site

Training requires the right working space. This may be a training room or a field site. Training rooms must be large enough for the participants to move around in and form small discussion groups, or small rooms must be available nearby. The training room must be free of external noise and have good acoustics so everyone can be heard. It should have good light and be able to be darkened for showing slides, films, and videotapes. If training is conducted at field sites, such as water treatment plants, it is important that discussion space be set aside for use after demonstrations or skill practice.

Materials

Training materials include appropriate written materials, such as handouts, job aids, case materials, reminders, trainee workbooks, and binders. Frequently used training aids are flipcharts, overhead transparencies, slides, videotapes, films, and reading materials. It is not necessary to provide elaborate or expensive training materials to do good training. There are advantages to using a few visual aids, however, because many learners are visually oriented and learn better that way.

Equipment

A range of equipment is available to support training. Not all of it is necessary, but effectively used training equipment can make a great difference. The basics are blackboard, whiteboard, easel for flipchart, pens and pencils, and tables and chairs for a classroom. A workshop or demonstration site and tools will also be needed if the training is in technical skill improvement. The next step up in equipment includes an overhead projector and a video camera and monitor. A further step up includes video editing and sound equipment and simulation equipment, such as pipe grids, model water treatment plants, and model workshops. Increasingly, the use of interactive videotape is very powerful as a tool. Self-paced instructional materials can also be useful for routine skill training and may warrant the investment if needed by large numbers.

Selecting and notifying participants

Selection of trainees begins with the needs assessment process. The important factors in selection are need, participant awareness of need, and supervisory involvement. Those who need training and want it and who receive the support of their supervisor in terms of follow-up usually get the most out of training.

The process of creating the right attitude about training in the minds of the participants begins before they arrive at the training site. It is important to prepare participants by notifying them about some of the things they can expect or need to be considering as they enter training. This includes an idea of the time required, what they should bring, and any prework to be done, such as reading or filling out questionnaires or inventories.

Scheduling

The need to determine a master calendar for training has been discussed. On the micro level, training should be scheduled to avoid major distractions, such as holidays, special events, or heavy work production times, such as the end of the fiscal year for accounting staff or critical construction times for construction staff. Time spent in training should not be compensated for as an "extra" but should be a normal requirement of employment. Scheduling training during normal employee free time, however, should be compensated for with equal time off or extra pay.

3.8 Effective Training Is Evaluated and Improved

An important part of ensuring intended results is following up to determine if behavior on the job has been changed or performance improved after training. Assessing the impact of training is one major purpose of evaluation. The second major purpose is gaining information needed to perfect the delivery of training and increase trainee satisfaction with the conduct of training. The second type of evaluation is more often done by trainers than the first, probably because it is easier to accomplish and of immediate interest to the trainer.

Impact evaluation at the general level can be accomplished in several ways. There are only a few methodologies for systematically measuring training effectiveness at the individual or micro level because there are too many uncontrollable variables to be able to determine whether it was the training intervention that created the desired change. However, it is possible to use the "black box" method to measure change in output. The "black box" method is termed as such because the researcher does not know precisely what takes place inside a black box to produce change; all he or she knows is that after a variety of treatments/experiences, performance is different. Indicators such as improved production, lower employee turnover, cost savings per unit of production, reported improved employee satisfaction, accomplishment of required tasks within required standards (compared with non-accomplishment before training) are all performance measures that can be evaluated.

The methodology of any measurement requires a pre- and post-training measuring procedure at the level of the individual trainee or the production unit. This usually consists of observation, formal tests, or indirect means, such as statistical analysis or analysis of performance indicators through the management information system. It is difficult and time consuming to design and validate accurate pre- and posttests for individual performance. At the same time, comparing unit production requires that either all persons in a given unit be trained together or the time period for the measurement be long enough to ensure that most individuals in a given unit are trained before the post evaluation takes place.

Evaluation of trainee satisfaction with training is usually done informally by observation and discussions during or after training and more formally by using a training evaluation questionnaire at the end of a training program. Good training attempts to establish an open and frank dialogue between trainer and trainee so that positive and negative feedback becomes the subject of discussion at regular points during training. Training questionnaires should be structured to include a scale (1 = low, 5 = high is most often used) for rating the extent to which the objectives of training were achieved and open-ended, opinion-type questions to elicit feedback on improving training.

4

DEVELOPING A TRAINING CAPABILITY

4.1 Establishing the Training Function

How do the elements of training discussed in Chapter 3 (needs assessments, training designs, adult learning methods, skilled trainers, and training management) get put into place? What must be done to build a training capability?

There are a number of important considerations in starting up a training function or in redeveloping a training function that has not worked. The following factors should be considered:

- Top management must see the need for and understand what training can and cannot do for the organization and what is involved in creating a training function.
- Key supervisors or managerial users of training must be involved in and support training; they must believe that training will help them do their jobs better.
- Decisions must be made about where training fits on the organizational chart and how it should be structured.
- A rough estimate should be made of how much training will cost (and save) the organization.
- The training department must recruit staff, develop them into trainers, and begin the department's work.

4.2 Creating a Vision for Training: Getting Commitment from the Top and Involving Key People

Support from the top is critical to establishing the training function. So is the support of those who have a stake in better staff performance, such as management and supervisory staff. In institutions in which training is successful, all of these actors are not only involved in training, they understand what training can do for them. They have a vision of training as a function and they have an agenda for getting staff trained and continually learning new ideas and skills. A basic part of that understanding is the knowledge that a training capability

is an integral part of the complete management framework. Training must be a response to management's vision of overall direction, efficiency, performance, and use of staff resources.

When management does not have a clear vision of the organization's purpose and goals and the role of training in both, training often is not done or is done haphazardly. In many development projects, because funding for training is available, training can become an exercise in "training for training's sake." People are sent to training "because they are supposed to attend." When the funding stops, the training function stops or becomes marginal. Training that becomes an end in itself may or may not be relevant, but it usually does not enjoy appropriate support, and its impact is often minimal. Follow-up is seldom done to ensure that training is relevant and used, and those who leave training return to the same practices and system as before, with little or no support from their supervisors or colleagues.

A vision for training includes an understanding by top management that training is a tool with potential to influence not only staff but clients, consumers, or other important stakeholders. The presentation and group discussion methods in adult training have a wide range of applications. In water and sanitation programs for small rural villages and communities, for example, training is frequently used as a means of educating the community about the use of water, or community associations about the administration of water systems. Training is a means to create change. If fully used and understood, it is a powerful tool. When misunderstood, or ill used, it is a waste of time and resources and can even have negative effects, such as turning out incorrectly informed or poorly trained staff, hostile or bored training participants, and more dependent and alienated employees.

4.3 Deciding How to Structure Training

Should the training function be structured as a self-contained department or a department with auxiliary trainers from the organization? Should it not be a department but rather a network of individuals with part-time training responsibilities; or should it be performed by a contractor outside the organization? Should the management of the training department or function report to top management, to the personnel office, to a technical office, a regional office, or some combination of these? How large should the training department or training capability be? All of these questions must be considered in determining the structure of a training function. In Appendix A, case examples of an urban and a rural training department are presented in which suggested answers are presented to many of these questions in particular settings. Some general guidance is presented below, but it must be emphasized that there are no hard and fast rules for many of the questions relating to the structure and composition of training as a function.

An effective training structure requires a means to deliver more than one-time learning "events" scheduled in isolation. A more complete system has to be built if training is to have the capability to help implement management's vision of the organizational agenda. The term "training system" refers to training capacity in the larger sense, including a training department and those who participate in delivering training at various levels. It includes the people who are trained, all skill transfer and training agents (professional trainers, supervisors, and informal trainers), and the planners and managers of the training process.

For training to meet the full range of skill and knowledge needs in the organization, it should be organized to meet needs at different levels. Top and middle-level management, as well as technical and operational staff, need a way to obtain training. Community members and other people outside the organization may also need training.

Training capacity can be organized in many ways, as long as training needs are met. There is no secret formula, but a good training system has the resources and clarity of management and purpose needed to do its job. The following are determining factors in structuring the training function in a water supply and/or sanitation organization.

- Numbers to be trained, relative degree of need, and size of training function.
- Staffing: Who conducts training?
- Centralized or regionalized configuration of the organization.
- Rural or urban water system.
- Financial orientation and resources available.

4.3.1 The Large, Self-contained Training Department

In Appendix A, a model training department/organization is presented as part of an organization that serves provincial cities and small towns. The example assumes a mix of permanent training professionals and regular supervisors as part-time training staff. This type of departmental structure minimizes the number of permanent training personnel on overhead yet is able to get the job done. It has the added advantage of making training a part of management's job.

Another option would be to have sufficient permanent training staff to conduct all or most of the training. If an organization is small and the potential number of supervisors for training assistance is limited, a self-contained training department might be the only alternative for getting the job done. This would probably require staffing a department with

more people than is desirable for the long run, but a short-term need might require this strategy. After a critical mass of staff are trained, the department could reduce the number of trainers and, perhaps, contract out certain types of training.

Possible constraints to setting up a self-contained training department are size, cost, and acceptance. The organization may not have the resources to support a large training function (even if needed). A large department may also be seen by other managers as competing for resources. Internal politics and competition may be a factor in the acceptance of the department.

However, an organization cannot ignore the need to train people. This requires resources. A development project with outside funding might be able to fund enough training to raise the overall level of an organization's performance and subsequently institutionalize training permanently at a level sufficient to maintain skills, but with fewer permanent staff. This would require a long-term strategy to work toward a mixed staffing strategy.

If an organization conducts training in small groups, either in classroom or field settings, and maintains a ratio of 1 trainer for every 20 trainees, training will require substantial staff resources. It is estimated that it would require up to 20 trainers working for 30 months to provide sufficient training to permit all staff to attend one 10-day training program in a system in which 6,000 employees have to be trained (1 trainer per 20 trainees giving one course per month). This scenario does not even consider course development time, vacations, and holidays. Nor does it consider that in a very deficient water authority, probably three times that much training would be needed, which would require 60 trainers with probably 15 support and supervisory staff. Now the training department has 75 people in it! In the sample organization in Appendix A, this problem was mitigated by contracting out three training areas (accounting, basic job orientation, and senior management training) and working with a lean, mixed staffing operation.

Another difficulty in having one large training department is staffing it with the best technical people for the technical content training. Staff who are technically strong and who are also able to learn how to train are in limited supply. In a weak system they normally are required for supervision. Training, as a professional area, holds few advancement opportunities for engineers and technicians. Special strategies would be needed in order to utilize the best skills available for training while permitting technically qualified professionals a normal career path.

4.3.2 The Small, Self-contained Department with Linkages to Other Resources

Successful training has also been organized using a small, self-contained training department staffed with technical personnel who become training specialists and a highly skilled training

expert or two to manage the training function. This mix can work if the department's efforts are supplemented by contract trainers and selected outside resources, such as courses provided elsewhere, guest trainers on contract, or a network of ancillary resources.

If an organization is highly regionalized (e.g., a rural water supply organization with a small central office and linkages with other entities for technical support, say, a health ministry), this model may be the most appropriate. It would be important in this situation to have a mechanism for managing the cooperating resources, such as periodic training conferences or joint training of trainers. This structure is also used when the skill needs for the organization are not great and training is not a high-profile operation in top management's agenda.

4.3.3 Contract Training and Outside Training

Other approaches to training include developing a network of outside resources and purchasing specific training services as needed. The training department may consist of only a training coordinator or manager. There is a danger, however, that overreliance may be placed on generic, prepackaged training. This type of training is seldom suited to the specific needs of an organization. "Tailor-made" training is usually the most appropriate. However, highly specialized training for which there is infrequent demand, such as the use of specific computers, engineering design, and foreign language training, is best left to those who specialize in it. It is not cost-effective to maintain specialized training of this nature within a training department. Contract training is generally done in conjunction with in-house training.

4.4 Centralized and Regionalized Structures

There are many examples of centralized training departments that serve a regionalized operation. Training is accomplished by developing regional coordinators and identifying particular individuals throughout provincial operations who can provide training with support from training specialists from the central training office. If an operation is highly decentralized, however, a way must be found to support training needs at regional or decentralized levels, particularly if on-the-job training (OJT) is a strategy or the focus of improvement is entire water treatment plants or a rural area of operation.

The fact that an operation is regionalized does not necessarily require a complete matching regionalized training organization, however. Economies in training delivery may be achieved by bringing staff from all regions or provinces to a central point for training. This approach is sometimes used when specialized training equipment is required, for example, for training pump mechanics. This approach is also a consideration if high-quality programs are expensive to design and deliver and the people needing a particular program are dispersed.

If the organization has few skilled trainers, it may also be most efficient to station them in a central location instead of trying to provide the same resource in each regional operation.

A combination of decentralized and centralized training is probably the best solution in many cases. The principle is to put training resources where the need can be met in the most feasible, efficient, cost-effective, and qualitatively appropriate manner. Each situation requires analysis and a structure that is appropriate to that situation.

As discussed in Chapter 1, rural water supply (RWS) is often the responsibility of several agencies, which means that no single agency has the specific responsibility of training for RWS. In countries where a single agency is responsible for RWS, it is possible to focus the responsibility for training. A rural water supply program left to its own devices by a ministry may even be totally outside any umbrella organization and be the responsibility of small community organizations. Examples do exist in more advanced countries of rural water supply programs finding ways to form associations and professional support guilds that provide specialized training for operators and administrative staff.

The analysis needed for setting up a training system for rural water supply requires attention to the geographic spread and the potential for training support within existing structures. If the country is very large and the need highly dispersed, training capability is best provided at regional centers, if the cost of travel is not prohibitive. One approach is to create a training "network" to support training. This approach is being used in Zaire, where the WASH Project has assisted in developing a training system for rural water supply (refer to WASH Field Report #160, *Training Plan for the Water and Sanitation Component of SANRU II (Rural Health—Zaire)*. A training system was established by locating potential trainers at different levels (provincial, subprovincial, community) and developing a core of training specialists from several agencies at the upper levels of the pyramid to conduct higher level workshops and train trainers at lower levels. This concept of a national training team drawn from multiple agencies is one approach that can be used when a number of agencies have responsibility for RWS. The disadvantage of this approach is that no one agency considers the training team its resource and uses it systematically. As described in Appendix A, one approach to structuring training for RWS is to give a "regionalized" agency under a ministry of health permanent responsibility for RWS.

4.5 Reporting Relationship of Training

The reporting relationship of the training department varies by the type and size of the organization it serves. Small, municipal utilities do not even have training departments; they use supervisors as trainers and conduct on-the-job training. Large, semiautonomous state water companies usually have an organizational structure that separates administrative and management functions from operations. These companies often place the training department within one of the service functions (e.g., HRD or staff development, planning)

or create a stand-alone department solely for training. Training may be important enough in the start-up phase for the training director to report directly to the chief executive officer during the first five years of the program or beyond that. This is because top management may have a particular agenda for training in the first five years.

Training is also sometimes placed under the supervision of the personnel department in an organization. The personnel function is important in relation to training. Communication with the personnel department regarding the required skills for staffing and the ability of training to overcome skill deficiencies is important. Poor recruitment can undermine the investment in training if inappropriate people are placed in jobs. Training can only be effective to a certain extent. Staff have to be "trainable" and that usually requires some basic literacy and background.

On balance, however, it is not recommended that the training function be placed within a personnel function. Line managers and the personnel department usually are in a naturally adversarial position. Managers want the best staff as soon as they can get them. The personnel department must follow procedures and deal with overall staffing needs. The training department should be viewed as a service or response mechanism to management. It will unnecessarily complicate management's agenda to place training subordinate to the personnel function.

The training department must coordinate closely with the personnel function, however, in terms of recruitment, selection, benefits, and compensation. In the course of doing needs assessments and conducting training, the training department will collect information pertinent to the recruitment and selection of personnel. This information should be provided to the personnel department to help guide future hiring decisions and reviews of benefits and compensation.

4.6 Recruiting and Developing Trainers

Developing a training capability would not be complete without trainers. In a development setting, when projects are funded to strengthen water and sanitation organizations, trainers usually have to be developed. The question is often asked, How does one become a training professional at the level required? Where do trainers come from?

As noted above, one strategy for building a training function, is to try to recruit some of the key training staff from within the organization. This has the advantage of using individuals who know the organization and are known within the system and may have established credibility with managers and staff. It has the disadvantage that people with the appropriate background may not be present within the organization.

Trainers who are recruited from outside the organization would probably have some previous experience in training. A distinction should be made between those who will become training professionals (specialists) and those who will work in training as technical trainers for a limited time.

Training specialists should have some background in the social sciences. Educational preparation in some or all of the following subject areas is very desirable: organizational psychology, sociology, adult education, management sciences, and communication. It is most important that training specialists be able to communicate well and work effectively with people. Good trainers are good communicators. They should also be very interested in training and want to learn about it.

Training cannot be learned only from books, however. Training is one of those areas that is best learned through apprenticeship. Effective trainers usually have had a great deal of experience working with master trainers. The theoretical preparation for training is important and it can be gained with study, but the practical aspects of training require tutoring, observation of good training, and a certain amount of trial and error. It often takes four or five years of continual training experience, working in a full range of training situations and conducting different tasks in training, to become skilled as a trainer. To be able to design training, write training materials, and effectively conduct training that involves a range of training techniques requires a great deal of skill.

Training technical trainers and beginning-level trainers is traditionally done through a training development program given in short installments, often called training-of-trainers workshops. Programs to develop training skills are offered by professional training organizations in the United States and Western Europe, sometimes combined with university studies and graduate work in instructional technology, adult education, or organizational psychology. They are also developed and delivered by consultants provided by agencies funding particular projects.

A training-of-trainers program works well if structured in three phases—a basic, intermediate, and advanced series of workshops. Each phase should include workshop instruction followed by study and on-the-job training experience. It requires about a year and a half to two years in a program like this to develop trainers.

The advantage of a program structured into segments with internship and practice built into it is that the program itself demonstrates the methodology of adult learning. It effectively demonstrates the power of the learn-by-doing approach. This approach also incorporates practice and coaching and allows the training agenda to be started. The training needs of the organization become a "learning laboratory" for developing the training function.

4.7 Deciding if Training Is Warranted as an Investment

The full cost of training is seldom calculated in water and sanitation organizations, just as the full cost of in-house engineering for a water treatment plant or the cost of billing a customer is seldom calculated. Any full measure of training's cost versus its contribution to cost-effectiveness would have to include a measure of the cost of inefficiency. This would include such factors as down time, mistakes, equipment replacement due to poor maintenance, low collection rates, and so on. Any factor that training can improve would have to be compared with the cost of training.

The cost of training is not easy to calculate. As described in Section 3.7.1, training is often budgeted using a formula of percentage of total personnel costs (3 to 10 percent). However, it is important for management to be able to judge whether training is worthwhile as an investment. Direct or recurrent training costs include the cost of staffing and running the training department, both fixed costs (staff, space, equipment) and operational costs (supplies, travel). If one took a one- or two-year period and divided the number of trainees trained into the total fixed and operational costs for training, an average cost per trainee could be calculated.

Guidelines for determining if training costs too much or too little are difficult to establish because of the large number of training situations and other variables across countries. It is also beyond the scope of this document to offer specific guidance on how to measure the cost-effectiveness of training. One should consider how much training is needed, the size of the organization and its geographic spread, what would happen if training was not conducted, current salary costs, current operating costs, and so on. Cost-effectiveness requires that the training be structured to serve a large enough population to support the overhead. In addition, it is not cost-effective to support a large training department that does not improve staff performance. It is also not cost-effective to neglect training and incur the expense of extensive plant and equipment rehabilitation or replacement every 5 to 10 years. It is not cost-effective to provide ineffective service and subsequently incur high health care costs because the population has poor water and sanitation services.

4.8 Summary

This chapter has discussed many of the considerations for developing the training function in water and sanitation organizations. Developing a responsive and useful training capability is not an easy undertaking, but it has been done many times. In summary, a training capability can be developed if

- Top management sees the need for training, understands what training can and cannot do for the organization, and is committed to training.

- Key supervisors or managerial users of training are involved in and support training.
- Training is structured to meet the agenda that management sets for it.
- The appropriate resources are provided for staffing and conducting training.
- The training department has staff recruited and developed into trainers.
- A training plan is developed and implemented.

Appendix A

STRUCTURING A NEW TRAINING CAPABILITY: AN URBAN AND A RURAL EXAMPLE

Appendix A

STRUCTURING A NEW TRAINING CAPABILITY: AN URBAN AND A RURAL EXAMPLE

In this appendix an example is provided for structuring an urban water supply system that serves provincial cities and towns (a regionalized, decentralized organization) and a rural water supply agency that is organized with a central office and a number of provincial offices. An example is also provided of a typical rural water supply training operation that is housed within a government support agency for rural sanitation.

1. The Structure of an Urban Example

This hypothetical water supply organization has a training system structured to meet its minimum needs for training. This example is only one possible way of organizing training; other variations have been discussed in the text. It is illustrative of the need to structure the training system so that it responds to the size of the training population, degree of training need, variety of need, budget and manpower constraints, and involvement of supervisors and staff at different levels in training.

The target organization is a national water supply organization with 7,161 employees serving only small towns and provincial capitals. Other organizations serve large urban centers. Rural water supply is managed by community organizations supported by the Ministry of Health and is not directly supervised by this organization. The organization has 175 water treatment plants that distribute pumped, filtered, and treated water to metered household connections. There are four regional offices. The water authority is responsible for designing and constructing water systems; producing and distributing water; billing and collecting user fees; and in general serving the best interests of the consumers by providing for good quality water at cost-effective rates. All systems are owned by the government; community participation is achieved through town councils.

There are 2,730,000 consumers spread over 15 provinces, an average of 15,600 consumers for each treatment plant. Each treatment plant is responsible for its own clerical and collection functions. The central office has 1,200 employees and the rest of the staff

are distributed into regional offices or plant-level operations. The staff of the organization is distributed into the following job categories:

Plant managers	175
Plant operators, pump operators, and technicians	1,575
Chemists	175
Meter readers	1,750
Clerical staff	1,800
Chief clerks	200
Engineers (serving in technical and managerial capacities)	220
Administrative staff (accountants, personnel)	175
Drivers	250
Casual laborers and watchers	800
Regional and local heads of departments	35
Top managers	6
Total	7,161

1.1 Numbers to be Trained, Degree of Need, and Size of Training Function

A number of questions have to be addressed in setting up the hypothetical training system:

- How many people will be trained?
- What kind of training is needed?
- What is the degree of need and how long will it take to meet it?

The answers to these questions will provide essential parameters for planning a structure for the training function. For example, it is important to know if staff will require a great deal of training for, say, the first three years and then less after that. In some situations, for example, one may assume that once a strong core group of trained staff is formed only refresher training every year and a half or so will be needed. Attention for training in that case would be focused on newcomers. Will all staff at certain levels have to be trained in certain basic things, such as organizational and personnel policies? Or will training be limited to a few essential technical skill areas? The determination that must be made is how many training programs of various types will have to be designed and carried out and how many trainers will be required

Effective training using adult training methods requires a ratio of roughly one trainer for every 15 to 20 participants in a structured training session. When training groups include 25 or

30 trainees, two trainers are needed to handle the amount of information and interaction, and maintain the pace, required in adult training.

It would take one or two persons in a new training department about 2 months to design a 10-day training course the first time they put one together (assuming they are learning training design skills, how to conduct a needs assessment, and materials development).

Let us work through the example of our hypothetical organization to determine the size and structure of the training department. We will use the above trainer-trainee ratio and assume that a new training system will be put into place. We will also assume that about one-third of the training staff will be full-time professional trainers and that the remaining trainers will be recruited from existing supervisory and other staff. This will enable us to build a training department with as few people as possible, while still meeting training requirements.

Let us also add in some of the needs assessment data that were collected preparatory to setting up a training department:

- All technical, plant-level personnel from the managers down will have to be trained in basic operations and maintenance (O&M) and water treatment processes initially because of downtime due to breakdowns and because water quality is low. It is clear that the need is for skill training because a major rehabilitation program has rebuilt most plants but performance is still low. A series of job aids for plant operators and maintenance personnel must be developed.

- Pump operators and technicians need training in preventive maintenance.

- A specific course in process control is required for the chemists and plant managers. This will have to be staged over three years into basic, intermediate, and advanced courses. This group also needs supervisory training.

- Meter readers need an orientation program on public relations and an OJT program in meter reading.

- All supervisors need a course in basic supervision. The regional and central office management staff very much need management training.

- All staff need a basic orientation course on the mission, goals, and role of the organization, as well as on the importance of having a consumer orientation.

- All clerical staff require basic skills training in office procedures, filing, and work organization. A new filing system is needed.

The data above give an indication of who needs training and the breadth of the curriculums that have to be developed. Numbers from the employee census can now be matched with needs, and a manageable training program can be shaped by dividing the organization into training classes of groups with similar needs. The data also point to the need for some nontraining solutions, such as developing a new filing system. It is important to identify the nontraining solutions to performance problems and decide if the training department should be responsible for implementing the solution or if another department should handle it.

Starting with the highest training priority O&M to produce sufficient safe water, we can consider all chemists and O&M plant managers as one universe. Let's call it the O&M leadership group (175 plant managers and 175 chemists). The remaining 1,575 operators and technicians we will call the O&M delivery group.

We can form one training subgroup with the O&M leadership group (350) and develop a strategy to train them first. From this group we can also select promising candidates to learn how to be trainers so they can assist in working with the group they supervise, the O&M delivery group. If we were to divide the O&M leadership group into training classes to attend a training course in process control and plant operations, we could form 14 training classes of 25 participants. Let us assume that this group could all be given one 10-day course within the first year before going on to more training.

In order to provide appropriate training staff at sufficiently senior levels to work with this group, we are going to have to recruit and develop professional trainers who can command the respect of this group. This will require two instructors working for six months to prepare and conduct the first training course. Subsequently, intermediate and advanced training for the leadership group will have to be provided over the next five years.

O&M Leadership Group

Trainers Needed	Course	Trainees
2 professionals	Plant Process Control and Operations	350

We now have an O&M training group consisting of two full-time trainers.

Next, let's consider how to train the O&M delivery group. As stated before, this group consists of plant and pump operators and technicians (1,575). We can break this group into geographical regions in the country to see if it is possible to train them by region. In terms

of numbers alone, this group could be divided into 60 classes of 25 to 30 people (assuming that any given training group will vary from 25 to 30 with absentees). Let's also assume that all of this group will need at least two weeks of training each year for the next five years, using a mix of classroom and on-the-job training.

Let's assume, further, that we will attempt to set up one team of two trainers for each of the 15 provinces. These trainers will be recruited as seconded staff who already work in a province (not necessarily the same province they will train in). These individuals will be staff who have graduated from the O&M leadership class and have proved to be good potential trainers. Assume also that the 1,575 individuals in the O&M delivery group are fairly well distributed into about 100 individuals per province. This would mean that each provincial training team would deliver three two-week training courses per year. Their total time commitment will have to include an additional eight weeks of training design and management time. This amounts to three and a half months of their time for about the first two years, after which less preparation and management time will be required.

Our group of 30 "field/on-the-job trainers" will need some support from experienced training specialists. Because the two full-time O&M trainers will be occupied for the next five years conducting senior-level O&M training and developing courses, we have to add two more professional trainers to the training department.

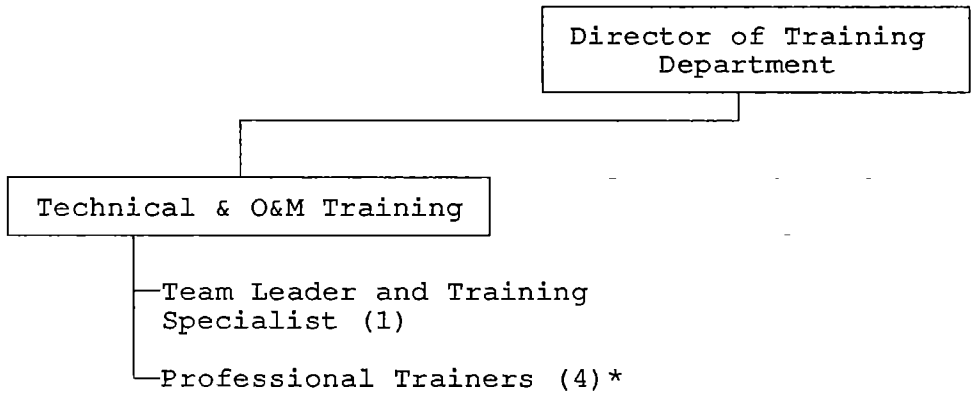
O&M Delivery Training Group

Trainers Needed	Course	Trainees
2 professionals full-time		
30 part-time*	Basic Plant Maintenance & Introduction to Process Control	1,575 plant operators, pump operators, technicians

* Seconded staff, not a regular part of the training department.

1.2 Structure

If we stop to analyze our emerging training function, we now have the beginning of a technical training department.

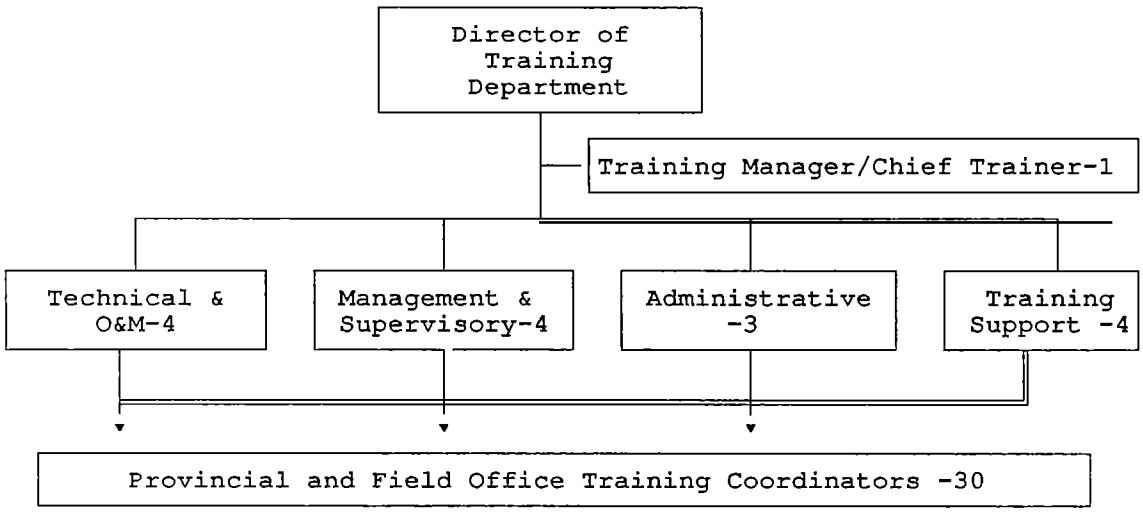


* Assisted by 30 supervisors who conduct OJT and regional training on occasional secondment.

A team leader/training specialist has been added to ensure an appropriate level of supervision and quality control for the technical trainers. The O&M training group reports to a director of training. If more training units were operating, perhaps a deputy director or chief training officer would have to be added.

If we continued to analyze each training need in order to structure training, that is, determine the size of the training function in terms of the number of trainers needed and the areas of training to be covered, it would be possible to build a more extensive training function. It is important to consider the training strategy in this process. If it is possible to use supervisory staff to help conduct training, then a smaller training department can be developed and efficiencies can be realized. The completed training department with a set of core courses included and appropriate training support would look something like the following.

Trainers Needed	Course	Trainees
O&M Training Group		
2	Plant Process Control and Operations	350 plant managers and chemists
2	Basic Plant Maintenance & Introduction to Process Control	1,575 plant operators, pump operators, technicians
Management/Supervisory Training Group		
2	Introductory and Advanced Supervision	385; all supervisory staff
2	Management Practices	385
Contract Staff	Senior Management Training	41 mid- and upper-level managers
Administrative and Clerical Training Group		
2	Clerical Procedures	1,800 clerks
Contract Staff	Improving Bookkeeping Practice	100 accountants
1	Secretarial Procedures	200 chief clerks
Contract Staff	Orientation Training to the Water Authority	All staff and new staff



The role of the provincial and field office training coordinators listed above is to serve as auxiliary staff, or cooperating trainers and managers. Because the model organization is a regionalized operation, provincial and other staff assist the training department. It is their job to report on training needs, help to conduct needs assessments, conduct occasional training, and assist in the management of OJT. These coordinators are primarily supervisors who have other responsibilities, but who have been trained as trainers.

The chart above represents one configuration for the training function for the sample provincial water authority. The training support function would normally have a capability to support the training information and delivery functions. The support staff would consist of an audiovisual technician, an overall training administration coordinator to keep track of training data, and word processing and clerical support–two people.

The total staff of this training department would be about 17 persons. As a percentage of the total staff, this represents less than 1 percent–about 1 training department person for every 421 employees. If we take into account the other 30 people who assist the training department part-time, the ratio of trainers to staff becomes 1 to 152, a plausible level of training support. The use of a number of supervisors and provincial staff to assist in training as technical trainers on a part-time basis is commonly done and necessary. It is also an advantage for the organization because supervisors who also train have an increased stake in good employee performance.

Another assumption made in the structuring of our hypothetical training department is that for the next five years, all staff are probably going to receive some kind of training more than once (every year for some, once every two years perhaps for others). The training function under these circumstances requires a larger training department for the first five years, after which the training need may begin to diminish. Consequently, the ratio of training staff to all staff may decrease over time.

2. A Rural Water Supply Training Example

2.1 The Organization

The hypothetical model organization operates as a semiautonomous, state-funded rural water supply organization. The organization has responsibility for mobilizing village residents and assisting them in forming organizations that will become the owners and operators of small, community-managed water supply companies. The organization does not own or operate any water supply system. Its task is to provide the systems using community participation, to provide hygiene education related to the use of water, and to assist the community water boards with operations and maintenance and hygiene education. The parent ministry for this Rural Water Development Organization (RWDO) is the Ministry of Health.

RWDO operates in 20 provinces. There are offices in each province. The provincial office is headed by a chief engineer, who supervises two promotion-construction teams (one engineer is assisted by two construction technicians and two community organizers) and a health-hygiene/operations and maintenance section. This section has community health agents assigned at a ratio of one agent for every five communities. It is the agents' job to provide continuous hygiene education and to assist community water boards in maintaining their operations (bookkeeping, administration, community participation, board elections, etc)

Above the provincial level is a regional structure to manage a regional service center operation. This is a facility that supports five provinces by providing operations and maintenance warehouses and supplying specialized equipment for construction and water quality control (drilling equipment and laboratories) and technical support services. All design, construction, and specialized skills for pump repair reside in the regional support operation Most training expertise resides at this level as well.

The headquarters office is in the capital city. This office acts to represent the affairs of each regional operation with the parent ministry and provides planning and normative oversight for construction and quality standards. It is a relatively small operation.

2.2 The Training Needed

The training function in this agency has two primary target groups (and there are subgroups within these). One group consists of the direct employees of RWDO. These are divided into promotional/construction staff and community hygiene workers. A limited number of specialized staff (provincial and regional managers, design engineers, and laboratory technicians) also are within the employee training universe. At the community-level, the primary targets for training are operators of small water systems, community water board

members, and office staff. Most of the water systems are gravity-flow systems consisting of a capped spring source, storage tank, and distribution system with meters and connections in patios or within houses.

Each province has an average of 80 community water systems (varying between 60 at the lowest end and up to 120 at the highest end). Each community water system has one operator, and one billing and office clerk. These are supervised by a community water board whose members donate their time. The board has a president, a secretary-treasurer, and three community leaders elected from geographic areas of the community. A provincial and "regional" (five provinces) breakdown of current persons to be training at the community level follows:

	By Province	By Region	Country Total
Operators	80	400	2,000
Bookkeepers	80	400	2,000
Board Members	400	2,000	10,000

The staff of RWDO also need training. During a project to strengthen RWDO as an agency, initial training was provided by project consultants in rural water supply design, construction, community health, community promotion, and the operation of systems. Training was also given in the process of training and skill transfer for many of the staff who were identified to work in training programs as an additional duty. The training department in RWDO must now incorporate this training into its curriculum.

The needs assessment indicates that the following training needs exist, by category of community-level training population:

Operators:

- Understanding of system function and basic operations
- Commercial procedures, billing and collection
- Community hygiene
- Water quality
- Preventive, corrective, and emergency maintenance procedures

Bookkeepers:

- Basic accounting procedures
- Introduction to community utility operation
- Managing client accounts and office procedures
- Introduction to community hygiene

Board Members:

- Leadership and management of community utilities: structure, bylaws, and legal responsibilities of board members
- Procedures for running community meetings, holding elections
- Management practice and principles
- Introduction to community hygiene

The needs for training the permanent staff of RWDO continue to be the same as those outlined above and developed during the project that created the RWDO structure.

2.3 Training Structure

By considering the above numbers, needs, and organizational framework of RWDO, it is possible to structure the training function. Some of the assumptions used in this process are as follows:

- Use training specialists to do training needs assessment, training design, training delivery, and evaluation.

- Use staff that work in the field to act as trainers in conjunction with training specialists to train community people.

- Structure training so that the staff of RWDO are trained using central office content specialists linked to training specialists at the central office.

- Try to mirror the overall organizational (decentralized) structure in providing training services

This leads to the following structure:

A small central office training unit

Duties: provide training quality control, develop curriculum and training manuals in conjunction with regional training staff; provide and coordinate training for RWDO staff. Act as support to regional training operations by assigning one training specialist as liaison to the regional service center operation.

Staffing: 12 persons.

- A director of training
- Five training specialists

A support staff consisting of
- a word processor
- illustrator
- administrative assistant
- resource manager
- an audiovisual and video tape technician
- a secretary

A regional training operation and facility in each of the five regional service centers

Duties: Provide continuous training to community-level staff following a core curriculum in regular training cycles throughout the year Conduct needs assessment to evaluate training effectiveness and develop training programs as needed.

Staffing. 6 persons.

- A regional training director/specialist
- Two training officers

Support staff:
- audiovisual assistant
- administrative and logistic manager
- a secretary

It is possible that over time the training staff may be reduced as the communities themselves become more self-sufficient A need for some ongoing support will remain, however, to carry out refresher training and training of new staff.

Appendix B

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Appendix B

BIBLIOGRAPHY

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Appendix C

ADULT TRAINING METHODS

	Level of Complexity	Method
I.	**Manual Skills**	
		On-the-job training (OJT) Demonstration and skill practice Simulation Job aids Self-paced instruction
II.	**Information Transfer**	
		Lecturette Assigned reading Lecture Slides, videotapes, and film Short talks Inventories Flipcharts
III.	**Concept Development**	
		Case study Problem-solving exercise Research tasks/field tasks
IV.	**Higher Level Skills and Attitudes**	
		Role play Situation replay Simulation Group discussion Structured group tasks or experiences Interactive videotapes Feedback

Adult Training Methods

Appendix C

ADULT TRAINING METHODS

MANUAL SKILL METHODS

The following methods are used primarily for hard skills, industrial, or vocational training (although not exclusively). Some of these methods are also used for skills training in such areas as bookkeeping or even public speaking. These methods are the most traditional methods used in training. They are directed at acquiring physical skills or the learning of routine procedures for the most part. These methods incorporate a great deal of trial and error in their methodology.

On-the-job training: OJT is often misunderstood as a method for training someone by putting them to work and letting them sink or swim, or get what they can from colleagues and supervisors. In fact, OJT requires as much planning and thought as any training method. OJT is guided learning using the workplace as the learning laboratory or field experience. Specific objectives are designed and communicated to the person (what exactly the employees are supposed to be able to do, know, demonstrate when they have completed OJT). A process of regular training oversight is also required so that the person in training is also involved in periodic learning reviews and reflections (if possible with others who are also in training) with the guidance of an instructor. OJT is very much the same as an internship or apprenticeship. The time frame of OJT, however, is shorter than a formal apprenticeship. OJT must also be designed with a progression of concepts and skills so that increasing levels of complexity and responsibility are provided. Thoughtful pairing of trainees with more experienced staff and/or instructor demonstration and coaching should be included in the planning of OJT.

Demonstration and skill practice: This is the most common method of skill training. If one were listening to an audiotape of a demonstration, it would go something like this: "Watch me do it, now you do it ... no, that's not quite right, it's like this ... try that ... good, now you've got it. Good!" A demonstration is a show-and-tell, now-you-try-it process. It is used to teach a large variety of skills from the manual to the verbal (language is learned, in part, by imitation). Demonstration includes not only showing how to do something, but correcting or coaching the performance until the right response is achieved. It also includes positive reinforcement by praise ("now you've got it right, good!") and negative reinforcement by correction ("no, that's not quite it yet, try this way").

Simulation: Simulation is a process that enables trainees to practice on a "dummy" before working with the real thing. It re-creates actual job conditions in a controlled environment. Many of the complexities and contingencies of the real world are included. One simulation used in many water treatment training programs for large urban systems is a pipe grid. This is a small version of a city pipe network, including a variety of valves and different pipe sizes The pipe grid simulator can be fully pressurized with a variety of pumps. With this device, trainees can practice making a tap on a fully pressurized line, change and/or repair a valve, dig and make appropriate trenches, make connections, install meters, and so on. Another example of a simulator is a laboratory model of a water treatment plant. This could be used for engineering training so experiments with different filtration media, water quality, chemical dosages, pressures, and so on, could be conducted and learned from.

Job aids: A job aid is a reminder. In the training setting, it is used in conjunction with a demonstration or some other training method. After training, a job aid is retained by the trainee and it is often used in the workplace to jog the memory. Job aids can be procedural checklists (the steps required for starting up and shutting down equipment, for example) placed at the work site (often laminated to keep them clean). They can also be small laminated reminders to be carried in a wallet (for example, the "eight rules for giving feedback," or rules for running a meeting).

Self-paced instruction: This method requires a written or computerized, step-by-step workbook that the trainee can use at his or her own pace. The workbook often includes reading material, illustrations, examples, questionnaires, tests, and problems to solve. This instructional methodology requires a built-in correcting mechanism, such as the answers to the test at the back or a computerized correcting device. This method can be used for routine tasks, such as learning the names of all the parts of a water meter, or information transfer, such as gaining an orientation to the structure of an organization and its products and services.

INFORMATION TRANSFER METHODS

These methods are designed to transmit information, either in written or oral form. In adult learning, the element of "discovery" is incorporated in these methods so that the learner is in control of the learning process as much as possible.

Lecturette: The spoken word is the most common means of transferring information in training or educational technology. A particular form of this

that is used for adult learning is the lecturette. The term implies a short lecture. In reality, it is not a lecture at all because a lecturette uses constant two-way communication between the trainer and the group. A lecturette is a short, interactive talk/conversation, or dialogue. The method requires that the trainer "pull" information from the group about their experience. The experience or input from the group is analyzed by other members of the group in open conversation ("what do you think about what Joe said?"). Ideas are interjected, along with content, from the instructor and members of the group equally. Trainers conducting a lecturette often use a flipchart or overhead projection or slide to display major talking points. Input from the group is recorded on a flipchart. This visualization of the information serves to make the content "everyone's property" and not solely the domain of the trainer.

Assigned reading: Materials assigned to be read before, after, or during training sessions are a self-instruction tool. They also serve as reference materials one can go back to from time to time. Assigned reading has traditionally been the most common means of information transfer, after the spoken word.

Lecture: The lecture is not an appropriate methodology for adult training; it is designed to transmit as much information orally as possible in the most efficient time span possible. Lectures are designed for large groups of people in situations in which group interaction is not required or very feasible. The lecture method derives from child-teaching practice and was extended into the university teaching model. A lecture requires audience dependency and passivity (except for note taking or questions and answers at the end of the lecture); it requires deference to the superior knowledge of the expert. This is exactly the opposite message that adult training strives to impart. The objective of adult training is to make the learner responsible for learning. Studies of information retention indicate that less than 10 percent of what is said in a lecture is remembered within 24 hours of the lecture. It is the least effective means to transmit information.

Slides, videotapes, and film: "A picture is worth a thousand words." This familiar saying demonstrates the power of using visual media in training. While most visual presentation methods tend to put the learner in a passive mode (sit back in this darkened room and watch), if care is taken to prepare the observer, provide an observation task, and debrief the observation, the process can be made to be somewhat active. Visual media can be effectively used to demonstrate good performance. The training design must structure the practice and analysis components to complement visual training devices if they are to be effective adult training methods. Visual media provide a

means for duplicating a highly detailed drawing and projecting it for all to see. They can be used to transmit technical information and can be very effective when accompanying a lecturette.

Short talks: Brief explanations are used frequently for field work (sometimes called "tailgate talks") or demonstration. They are usually done without the assistance of visual aids.

Inventories: Inventories are such things as personality profiles, choice and preference questionnaires, and opinion surveys. They are written questionnaires that individuals fill out in order to provide information about themselves (feedback). The inventory is scored and a profile of information is obtained. Many inventories have been given to large numbers of people over time and have been statistically standardized for accuracy in reflecting the "norm." The inventory deals with information collected within a particular framework (e.g., conflict management style, management style, or life-style preferences). It mostly provides information about the person who takes it. These devices are used most often to provide a person with self-insight or feedback.

Flipcharts: The flipchart consists of an easel that is loaded with newsprint or paper. It is movable and light so it can be easily moved around a training room. Flipcharts are used extensively in modern training. The lecturette talking points are written on them ahead of time for a training session, and they are used to record information (suggestions, ideas, comments) that trainees provide in training sessions. There are many advantages to a flipchart: the information on them can be saved for future reference (the paper is often stuck to the wall with masking tape for easy reference), the notes on them are easily visible to all, talks can be prepared on them, they can be used to ease interaction with the group, and the information provided by the trainees that is recorded on them makes it "the group's" idea since it is written down for all to see.

CONCEPT DEVELOPMENT METHODS

The following methods are designed to engage the participant in thinking-while-doing. A primary objective in these methods is to require that the participant examine concepts, ideas, and assumptions and acquire new ideas (perhaps) in the process. The methods tend to be somewhat more analytical (cognitive) than physical (psychomotor). In the adult training setting, all of these methods are used with small groups of people working together, with the exception of the written exercise.

Case study: The case study presents a written scenario that describes situations (like a written story) in the real world. A case study usually presents facts, problems, and dilemmas that require the reader to select from many possible outcomes. The discussion, a part of the case study method, requires the reader to defend why he or she selected a particular option. Well-written case studies are difficult to construct and require a great deal of skill in the design. A case study sometimes presents a continuing story or series of events over time (a progressive case study) that the training group returns to during a training session.

Problem-solving exercise: A problem-solving exercise is very much like a case study, but it is structured to present an analytical task for which there is usually only one optimum solution. Problem exercises are often used to teach math or engineering skills. If problem exercises are short, they are sometimes called "pen and pencil exercises."

Research tasks/field tasks: These are structured learning exercises that require the training group to conduct research, ask questions, interview, observe, or otherwise gather data outside the training room in the first phase. This is followed by an analytical phase, in which what has been gathered is discussed in some way and organized for presentation. The final phase is to present the group's findings, usually to other groups, for discussion and critique.

HIGHER LEVEL SKILL AND ATTITUDINAL DEVELOPMENT METHODS

The following methods are designed to require an integration between thinking and doing; they are both skill oriented and concept forming. These methods are used frequently to influence or challenge attitudes. These methods combine elements of simulation, problem solving, coaching, skill practice, and trial and error.

Role play: A role play is a situational improvisation in which a trainee is required to act out an open-ended scene using his or her own wits and skills. Information is given to the trainee only to set the scene and provide the context. All role plays take place in response to the question, What would you do if... . After the role play, the group analyzes what occurred (this is called "processing"). The trainers guide this discussion through carefully crafted questions. This enhances the opportunity to learn and discuss options for action and the consequences of actions. Often, after one person tries out a way to deal with a situation, another is asked to try out the same situation. This training device, when used correctly, is very powerful as a feedback tool,

a skill practice methodology, and a way to impart empathy for another person's situation.

Situation replay: This device is a simulation of a real work situation (as compared with a hypothetical situation in a role play) that is problematic for the trainee; it often allows practice or rehearsal of a new skill for the trainee The participant plays himself or herself in front of a small group, often a trio. The primary actor works through the work situation while a group member simulates the reactions of a person in the actual workplace. A third person in the group is the designated "coach." The trainee describes the situation and then "replays" what he did or will do. Situation replays are used to enable the trainee to rehearse what he or she is going to say or do in the job setting. The designated coach observes and corrects behavior that may not be effective by stopping the action (as if it were a live videotape) and starting it again after coaching.

Simulation: A simulation re-creates a situation for a larger group of people (as distinguished from a role play, which includes only two or three individuals) and enables them to try out skills or conduct activities approximating the real world or work situation. For example, if one were training a group in how to run effective meetings, a mock meeting could be structured and the entire group could participate in the meeting. After the simulation, an analysis would be made of effective and ineffective meeting behaviors. This could be combined with observers in the training group watching the process. Another variation could include making a videotape of the meeting simulation.

Group discussion: A group discussion is an open exchange of ideas, information, and opinions structured around a theme and, usually, a question or two. The group is given the task of reaching a conclusion or recommendation. Group discussions are often facilitated by a trainer, whose job it is to manage the communication process, helping the group to move along, focus on the task, and involve everyone. Groups with high levels of communication skills often facilitate their own discussions. Discussions are increasingly effective as training groups gain in communication and group problem-solving skills.

Structured group tasks or experiences: There are a number of "learning games" in which a task or series of tasks are given to a group to carry out. The adult learning process of examining the experience and drawing conclusions is a part of the design of a structured experience. Structured experiences can take the form of simulation games, outdoor exercises, choice and prioritization tasks (e.g., choose from a list what are the most important

items you will need to survive on a desert island), and values and preference selections.

Interactive videotapes: Videotape that is used as a "live" instrument by taping an event or situation and playing it back to the participants is termed "interactive video." The technique engages participants in viewing themselves and learning from the perspective gained. Videotapes can be made, for example, of a group conducting a meeting, or exercise, or fixing a machine. It can then be analyzed by the participants for learning. Videotapes can also be used to provide demonstrations of both correct and incorrect behavior. At critical points, the tape is stopped and the group is given a task or a question. The instructor then conducts an exercise with the group and analyzes it against the model provided on the tape.

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THE WASH PROJECT

With the launching of the United Nations International Drinking Water Supply and Sanitation Decade in 1979, the United States Agency for International Development (A.I D.) decided to augment and streamline its technical assistance capability in water and sanitation and, in 1980, funded the Water and Sanitation for Health Project (WASH). The funding mechanism was a multi-year, multi-million dollar contract, secured through competitive bidding The first WASH contract was awarded to a consortium of organizations headed by Camp Dresser & McKee International Inc. (CDM), an international consulting firm specializing in environmental engineering services. Through two other bid proceedings since then, CDM has continued as the prime contractor

Working under the close direction of A I D.'s Bureau for Science and Technology, Office of Health, the WASH Project provides technical assistance to A I D. missions or bureaus, other U.S. agencies (such as the Peace Corps), host governments, and non-governmental organizations to provide a wide range of technical assistance that includes the design, implementation, and evaluation of water and sanitation projects, to troubleshoot on-going projects, and to assist in disaster relief operations WASH technical assistance is multi-disciplinary, drawing on experts in public health, training, financing, epidemiology, anthropology, management, engineering, community organization, environmental protection, and other subspecialties.

The WASH Information Center serves as a clearinghouse in water and sanitation, providing networking on guinea worm disease, rainwater harvesting, and peri-urban issues as well as technical information backstopping for most WASH assignments.

The WASH Project issues about thirty or forty reports a year WASH *Field Reports* relate to specific assignments in specific countries; they articulate the findings of the consultancy The more widely applicable *Technical Reports* consist of guidelines or "how-to" manuals on topics such as pump selection, detailed training workshop designs, and state-of-the-art information on finance, community organization, and many other topics of vital interest to the water and sanitation sector. In addition, WASH occasionally publishes special reports to synthesize the lessons it has learned from its wide field experience.

For more information about the WASH Project or to request a WASH report, contact the WASH Operations Center at the above address.