DOCUMENT RESUME

ED 349 459 CE 061 975

AUTHOR Hamdan, Mohamed Ziad
TITLE Reformation Design of Training. A Handbook with a Behavioral Digital Approach.
PUB DATE 92
NOTE 153p.
AVAILABLE FROM Modern Education House, P.O. Box 815365, Jabal, Amman, Jordan ($6; quantity price $4).
PUB TYPE Guides - Non-Classroom Use (055)

EDRS PRICE MF01/PC07 Plus Postage.
DESCRIPTORS *Curriculum Development; Educational Technology; Evaluation Criteria; *Instructional Design; *Labor Force Development; *Needs Assessment; *On the Job Training; Organizational Development; Postsecondary Education; Program Evaluation; Program Implementation; Skill Development; Trainers; *Training Methods; Training Objectives

ABSTRACT

This handbook, which presents a design-based approach to training, leads training professionals through a process for developing employee training programs based on a behavioral digital approach. (The design approach is a scientific methodology built on three principles: the systematization, behaviorism, and quantification of training.) The handbook is organized in three parts: (1) Professional Needs Assessment for Renewal/Training; (2) Designing the Training Program; and (3) Designing Program Dissemination and Evaluation. The four chapters contained in part 1 cover the following topics: the reformation design of training, professional needs assessment of a job, professional needs assessment of an organization and its employees, and unifying professional needs and establishing behavioral digital bases of training design. The three chapters of part 2 discuss the design of the training curriculum (goals, knowledge and achievement activities), designing the instruction of training (methods, media, and technologies), and the design of human and material services. The topics of the two chapters of the final part are: designing the training document, program marketing, and preparation for implementation; and designing the evaluation of training. The handbook includes 49 references and an index. (KC)

REFORMATION DESIGN OF TRAINING

A Handbook with A Behavioral Digital Approach

Mohamed Ziad Hamdan (Ph.D)
Professor Of Education
President of Modern Education House.

Modern Education House
For Publishing, Consultation & Training
AMMAN - JORDAN

MODERN EDUCATION HOUSE
P.O.Box 815365 Jabal Amman
Telex 21410 Sheperd
Fax 00962 (6) 684551 / 686790
AMMAN - JORDAN

Contents

Part I: Professional Needs Assessment For Renewal / Training.

Part II: Designing the Training Program.

Part III: Designing Program Dissemination and Evaluation.

Preface

Inservice training as a form of continuing education is vital to professional success as its counterpart - the pre-service preparation.

While the last introduces the person to new knowledge, professions or skills, inservice training on the other hand maintains afterwards these professional inputs , updates them and implants new ones wherever this deems necessary .

Despite the immense technological advances and the explosion of knowledge that characterize many aspects of contemporary life , inservice training is still lacking of a truly disciplined operational methodology. It is suffering from being discriptive in nature, subjective in conduct and somewhat an open - ended activity.

What training really needs is an accountable methodology by which all professional acts from needs assessment to evaluation of productivity, can be scientifically and systematically planned, developed and implemented. This handbook presents a new approach in this line that is behavioral , digital and operational in structure; satisfying as expected the working needs of the employee, the organization and the job . . the trio determining factors of any training endeavor .

The practical and academic validity and reliability of the approach were tested by the Author through the implementation of two professional programs: "Specialists of Training" and Managers of "Training Administrations". The results were highly encouraging .

While the approach is believed to be different from what is available in the field , it operates with about thirty forms ; leading when used systematically to a training program that is valid , accountable and effecient.

More validity and reliability testing of the approach is essential however, to prove its final workability in different environments under varied conditions. Therefore, training parties are welcomed to provide thankfully the Author with any feedback concerning this matter. Moreover, if additional clarifications or training assistance regarding the application of the approach are needed, contacts with the Author are also welcomed on the stated address of Jordan.

Finally, special thanks should go to Dr. Karen L. Marcum, the director of the American Language Center in Amman - Jordan for reading the manuscript and making linguistic and typing corrections. The final language and academic qualities of the text remain however, the sole responsibility of the Author.

M.Z.H.

May 29 , 1992

Part 1: Professional Needs Assessment For Renewal / Training

1. **Prologue: The Reformation Design of Training.**
2. **Professional Needs Assessment of Job.**
3. **Professional Needs Assessment of Organization and Employees.**
4. **Unifying Professional Needs and Establishing the Behavioral Digital Bases of Training Design.**

Chapter 1

Prologue: The Reformation Design of Training

Introduction

Training is a direct approach to education . It concerns itself with the behavioral development of individuals by bringing their inadequate professional status to its required level of performance.

Training also is a behavioral operational act, necessitating simultaneously the application of both theoretical and practical knowledge. It differs for example from school education where cognitive - armchair epistemology is dominant .

Training moreover concentrates on reality, or on the felt needs of employees, organization and / or job, whether these needs belong to the present or immediate future.

Current literature on training, though contains tremendous information concerning: goals, skills, steps / stages, methods, media, technologies, support services, merits and problems, is considered very useful for understanding and guiding training acts, however, it is seen generally in-operational. It stops short from providing training specialists with objective and rational mechanism by which they could scientifically plan, construct and implement a professional development program.

It is noticed in this context , that while some sources (1) appear to be somewhat operational, e.g Abella (1989), Freedman and Yarbrough (1985), and Rogoff (1987), many others are still exclusively descriptive, incoherent and open - ended treatments of training. Hence, they are incompatible with the technical, behavioral and strictly time-bound acts of training.

What training actually needs is an accountable and integrated literature, specific and concise in language, instrumental in methodology, and measurable in content and products. In sum: a down-to-earth operational literature.

The rational method to achieve these qualities in training is possible through controling the quality of its attributes: programs and exe-

cution. A preliminary tool by which one could exert his professionalism in this regard is embedded in the art and science of designing.

Designing is probably the first act that God used in creating the universe. Training, without designing, will not lead to professional development of people in the proper sense. With poor designing, there could be many losses in manpower, time, efforts, logistics and outcomes.

Thus, considering the ultimate importance of design for training, this book presents a systematic behavioral and digital approach. It is hoped that the newly developed methodology is capable of reforming the designing processes of training, helping specialists to pull together the various pieces of training data, factors and activities, and to obtain, consequently, the professional development programs which they seek to achieve.

The History of Training - A Short Summary

Training, like teaching, is a prehistoric[2] and still persisting human activity. It occupied a good part of daily activities of early settlements of human kind, probably with the establishment of hunting communities during the Old Stone Age, a million or more years ago.

One could also infer from history that primitive man of the Stone Age, initiated the first type of training, that is the **informal method**, to help his offsprings and fellow men develop the basic life skills, such as: making stone weapons, animal skin dresses, wood utincels and dwellings.

With the advent of The Modern Store Age, about 7000-3000 B.C, new human developments had emerged within the realm of training, such as: the written language, agricultural settlements, bottery industry and domestication of animals. Despite of all these developments, training is believed to have remained, during this long period of human history, an informal labor.

The second principal shift in the status of training came about toward the beginning of recorded history around 3000 B.C. During this era, the **popularly organized method** by means of apprenticeship, was widely practiced in Mesopotamia. The use of this method, which is still effective for the conduct of training until today, was documented in Babylonia at the year 2100 B.C.[3].

Apprenticeship, in spite of the profound changes within human life which took place throughout the last four thousand years, is yet prevailing to a large degree. Ancient, medieval and recent societies up to eighteenth century, used apprenticeship as a basic popular method for developing almost all daily life skills, from farming, commerce, hand crafts and industry, sports, rearing / education of the young, to the inculcation of religion.

During the eighteenth century however, training was transformed to a new third approach that is the **formal method**. From that period on, training became an administrative, certificated business ... an intended schooling, and a relatively curricular pursuit.

In the United States for example, Moravian Brothers established in 1745 a training centre in Bethlehem Pa. The nineteenth century moreover was characterized by the foundation of factory training schools. Ho and Associates, and Westinghouse schools[4] are just a few examples.

Throughout the first half of the twentieth century, training had witnessed further developments, covering many of its endeavors like the setting up of professional affiliations (e.g. ASTD, NSP, ASAP) and the extensive use of new methods (e.g. laboratory training, case studies, programmed training and demonstration[5]). Training became a more planned, technical and standardized activity; thus, achieving its fourth major development: the **academic method** or the neo-technical formal method.

In addition, the second half of this century, with its accelerating technological advances, knowledge explosion, and the fever of narrow specialization, has contributed immensely to the formation of training as a specialized field of study and practice with much technology at its disposal.

This new status paved the way for training to crystallize its own terminology; and to have also its own epistemology, specialists, adult learners, professional materials, resources, facilities, equipment, machinery, technology, media and methods. Training at last has converted to a contemporary significant science: a compelling branch of the applied sciences. As a result , training has achieved its fifth working approach .. that is the **scientific method.**

Current Problems of Training

Training as a newly formulated science and profession, faces many problems in both developed and developing countries. These problems seem profound and comprehensive, covering almost every aspect of human endeavor.

In the United States, training in the spheres of education, business and public services is severely criticized by a number of specialists. One writer[6] has confirmed that the history of educational training / programs during the last one hundred and twenty five years, appears to be dim and unencouraging. The professional development on the whole has been taken for granted; and is lacking the appropriate systematic methodology. Hence, the generated results are characterized as mediocre and unconvincing.

Others[7] assured the above, adding that trainers seem incapable of living up to the responsibilities expected from them. Training programs, too, proved generally to be ineffective due to the absence of the theoretical and organizational frameworks which take into account the principles, theories and research findings of andragogy. Moreover, the hesitance to apply ongoing social, scientific, and technological developments has added to the problems of the training field.

A final critical remark concerning the weaknesses of training in the U.S., is noted by the recent professional book of the ASTD[8]. It cites that training is suffering from many deficiencies, particularly in the realm of human services. Training personnel, it indicates, are seemingly in need of professional development as is the case of their traditional customers: the trainees. Very few of them (e.g. only 2% on the undergraduate level and 6.1% on the graduate level) are found to be prepared professionally for training. It goes on to detail that 85% of all working personnel in the training field are recruited from different occupational and academic backgrounds other than training per se.

The problems of training in developing countries are more acute than in their developed counterparts in the west. The reasons, which are somewhat understandable, go back to the lack of qualified human, educational, material, and administrative resources. Kerrigan and Luke (1987)[9], and Shaffer (1974)[10] offer a meaningful treatment in this regard.

Further, Pan Arab States of the Middle East have experienced, like many other developing countries, several problems in training. The Author of this book, as a full-time trainer during 1988/1989 at the Institute of Public Administration (Riyadh-Saudi Arabia), used a questionnaire with about fifty trainees who participated in three inservice programs.* The problematic returns of the questionnaire are grouped within the following categories :

Administrative Problems :

The main administrative problems are found to be:

1. The inefficient organizational structure of training departments within governmental agencies or ministries. These internal branches of training are usually placed under direct supervision and rules of their sponsored institutions. They don't have budgets of their own, nor have they clear-cut training policies, independent decisionmaking or operating headquarters.
   Further, they are expected to follow literally the administrative instructions and wishes of the supervisors or top officers. Consequently, the training roles of these departments appear to be very marginal, and limited to paper work .
2. The absence of coordination among various administrations within the same ministry or agency concerning training. Each administration sees itself as the sole source of power and decision making; thus, it is the only party who should govern the training department. This administrative selfishness adds to the already existing problem of psychological gap which shatters the bonds of mutual confidence and daily contacts / relations among different officials.
3. The absence of objectivity when nominating employees for off-campus training. This process is accomplished subjectively by decision-makers to reward their personal beneficiaries or to appease acquaintances and followers; or in other cases, for punishing opponents by mearely distancing them for a while from the organization .
4. The lacking ability to plan, conduct, evaluate and follow up the activities of training. Most departments who are designated to pursue this endeavor, are not professionally qualified to accomplish training responsibilities.

* These trainees belong to the states of : Bahrain, Saudi Arabia, Yemem, Jordan, Sudan, Tunisia and Moroco.

5. The emphasis on the quantitative rather than the qualitative aspects of training. There is much concern with the number of available training institutions or departments, trainers, trainees/ graduates, resources and so forth, without a parallel attention to the qualities of these factors.

Programming Problems :

Training programs are found to suffer from the following problems :

1. Programs are not scientifically designed. The main reason behind this shortcoming is the lack of specialized personnel who are recruited for the job.
2. The weakness or the absence of needs assessment studies of training. Consequently, programs are established by either armchair designing, or by being based on imaginative training skills; thus proving to be invalid for the actual needs of trainees.
3. The alienation of some programs, due to their literal translation from originals abroad. This approach leads usually to invalid programs for the behavioral, social, psychological and administrative qualities of trainees and local environments.
4. The obsolete content of some programs. Programs are found in some cases to be outdated in professional knowledge and skills, or in the equipment, machinery, materials and methods by which they operate.
5. The lack of validity and evaluation of effectiveness. Program evaluation is either not existent or unscientifically conducted by unqualified personnel.
6. The overlapping of some programs' contents. This problem may result in some instructional confusions, differences in content covered, training techniques used, and the loss of valuable training time.

Implementation Problems :

Most problems encountered in this area, are:

1. Difficulties experienced in communicating and understanding training messages, especially in settings where personnel are of different nationalities. Translators in this respect are found to be ineffective.

2. The lack of practical opportunities offered to trainees by which they could exercise and master the mandated skills.
3. The insufficient use of adult learning theories and techniques while conducting training.
4. The exclusion of contemporary media and technologies.
5. The dependence to a large degree on lecturing, mainly due to the inability of trainers to use other techniques.
6. The absence of evaluative efforts that are designed to follow up trainees after graduation from training programs, for the purpose of correcting/ improving the training process.

Problems of Trainers and Other Human Services:

Training personnel are found to suffer from the following :

1. The low professional profile of trainers. Trainers are either totally strangers to the field, or unqualified to undertake the responsibilities expected from them.
2. The exterior language and attitudes of exterior trainers. Trainers are found to be unprepared psychologically to convey training messages to trainees from different backgrounds, in addition to experiencing some degree of value conflict while communicating with them.
3. The qualitatively and quantitatively limited human services available to training, particularly those of experts, specialized trainers, technicians, maintenance and secretarial personnel.
4. The lack of specialists in program designing. Individuals who claim to be designers of training are characterized by either unsound documentations for the job, or false personal perception of their actual abilities to accomplish the designing tasks. Hence, the observed products of such unqualified personnel are simply inadequate programs for the needed training.
5. The negative attitudes of training personnel which reflect upon their subjective interaction with trainees and the negligence in responding to the achievement demands of training skills.
6. The lacking ability of training personnel to use modern media and technology, practical instructional methods, and the principles of andragogy.

Problems of Trainees:

Trainees, too, contribute to the worsening problems of training by :

1. Indifferent attitudes towards the role of training in developing their professional skills, leading, thus, to the lack of concentration on learning and achievement .
2. Limiting the concept of training to money and promotion benefits, or to recreational needs, giving consequently little attention to the actual improvement of their professional skills.

Problems of Material Services.

Most problems concerning the material services are:

1. The lack of training resources such as textbooks, guide and work books, appropriate media and technology, forcing implementation to progress without adequate knowledge or necessary curricular materials.
2. The lack of financial support which leaves training without enough tools, machinery, equipment, materials, technology, and facilities which are all essential for implementation.
3. The slow pace of maintenance and repair work. Consequently, facilities, equipment and machinery are usually not available when needed.

The Reformation Design of Training-A Brief Illustration

The behavioral digital approach which forms the crux of the proposed design of training in this Book, is a technical disciplined mechanism by which specialists could construct the training acts from needs assessment to evaluation of productivity.

The designing approach is a scientific methodology built on three principles: the systematization, behaviorism and quantification of training.

1. Systematic training: the designing approach treats training as a system. This means that all the program components starting from planning to implementation and evaluation, are mutually interdependent, interactive, and logically derived one from another. They are moreover, consistent in nature, roles and outcomes. Figures I and II illustrate this principle.

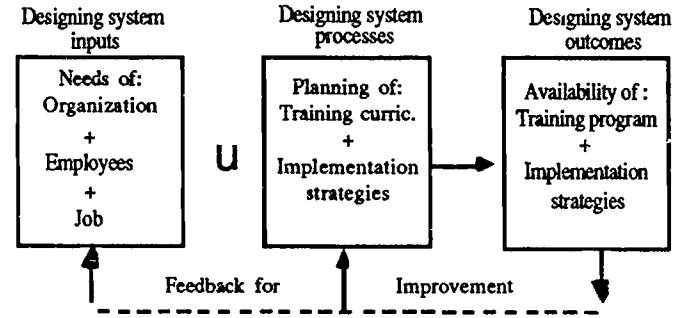


Figure I : The design system of training with its inputs, processes, outputs and corrective feedbacks.

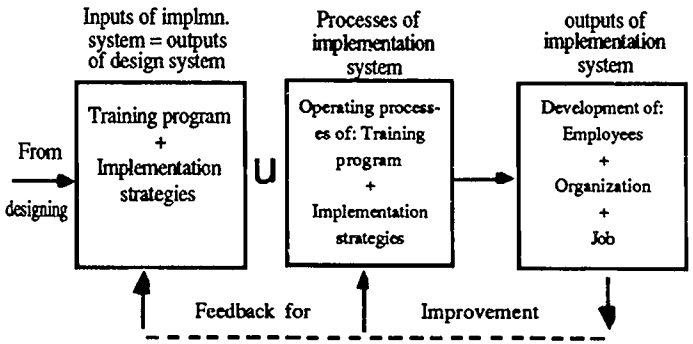


Figure II: The implementation system of training.

2. Behavioral training: this means that all acts and outcomes of a training program are observable and measurable in nature.
3. Quantificative training: this means that all program components and data could be quantified digitally or numerically .. hence, it could be stored in and treated by the computer.

While this book is concerned with the first phase of training system, the designing system, it provides, nonetheless, a blue print for the second one, the implementation system. The training map which results from the designing system is actually the operating substance of the second, the implementation system.

Foundations of The Reformation Design of Training

The behavioral digital approach of the reformation design of training, is based on the implications of several sciences. These are :

1. Cybernetic Psychology: since training in this book, is viewed as a behvioral system, its factors and processes should be logically and harmoniously channeled to achieve specific ends. The quality of these outputs will be judged then by pre-established criteria; determining directly the faulty aspects of the training system, whether they belong to factors, processes, or products. The next step is refocusing and correcting the system by employing defective indicators.

   While the general methodology of current designing approach has benefited widely from above cybernetic principles, several related training concepts are utilized, such as: simulators, simulation exercises/games, micro-training, the system method of training, and computer-assisted training.
2. Andragogy and Adult Psychology: these sciences make it possible to observe the concepts, principles, instructional techniques, communication style, personal/behavioral characteristics, as well as, psychological and physical settings which are all considered crucial to adult motivation, learning and interaction.
3. Behavioral Psychology: the principles of this science helps in the quantification of program's components: e.g. goals/objectives, knowledge, learning/evaluating activities, human and material services, products, and validity evaluation.
4. Humanistic Psychology: the current training design utilizes the main principle of this science, that is the "respect for man." Training, consequently, takes the responsibility of responding to individual different needs: physical, personal, social, economical, psychological and professional-from feeding his stomach to self-fulfillment. The effects of this framework may be observed throughout the chapters of this book.
5. The Sciences of Curriculum: instruction, administration, guidance, supervision and evaluation. The implications of these sciences appear concretely in chapters 5-9.
6. The Available Literature on Training[11]: this framework endows the present designing approach, its specialized terminology, epistomology, types of methods, media, technology, human and material services which are generally utilized in this book.

The Methodology of Developing the Reformation Design of Training

The behavioral digital approach which constitutes the substance of the reformation design of training is founded by the use of two main research procedures: the descriptive, and action-developmental method. The two methods are interweavingly employed throughout the following steps:

1. Analytic study of current training sources which are available in the library of the Institute of Public Administration (Riyadh - Saudi Arabia), where the author worked as a trainer during the year 1988/1989. The study provided the author with two major outputs:

   The first: The professional terminology and knowledge available in the training field.

   The second: The gaps or weaknesses which characterize training literature and practice.

   It is noted that training sources suffer from an overly-theoretical, inoperational tone that forces training to rely on invalid/in-effective programs and implementation strategies, and, consequently, to be satisfied with mediocre outcomes (refer to the paragraph: "current problems of training" in this chapter).
2. Administration of a questionnaire to a sample of fifty inservice trainees (as indicated earlier) concerning the current status of training. The results were summarized in the previous paragraph.
3. The development of eight designing forms, to be used in teaching a main unit called: "designing training programs"; which is required for a course by the title "Training specialists."

   The application's results were highly encouraging. Several forms, however, had to undergo some modifications/improvements. Furthermore, the introduction of two additional forms appeared to be necessary. Hence, the total of designed forms reached 10.
4. Application of the ten forms with ten participants in another training program under a title: " Managers of training administrations". The

trainees belonged, this time, to two Arab states, working as directors or managers of training departments within ministries / agencies of the following: a university, a tele-communications company, the ministry of the interior,the national gaurd, the red crescent, a post office,the civil aviation and a directorate of training institutes.

The feedback which resulted from the application of the ten forms was once again very encouraging . However, further studying of and contemplation at the nature, roles, contents, factors, and processes of training during the year 1990, have led to profound details and refinements of the designing forms, and the training behavioral digital approach which is based upon them. The outcomes of this stage which embody twenty-seven forms coupled with a concrete training methodology, are presented in the chapters of this book.

What Comes Next ?

This chapter presents preliminary facts concerning inservice training. These include basic concepts, major historical developments and problems, condensed illustrations of both the proposed behavioral digital approach to designing of training and the methodology by which it was developed.

Thus, the purpose of the chapter is to serve as a prelude to the understanding of the concepts and working mechamism of the new designing approach within the next eight chapters.

Chapter II starts with the first step of designing, that is, needs assessment for training. The step involves the study of a basic factor: the job. The third chapter completes the second task of needs assessment, that is of organization and employees.

Chapter II

Professional Needs Assessment of a Job

Introduction

Professional needs assessment is a surveying/ examination study by which the training designer either evaluates an on-going program against specified validity/ productivity criteria to determine its future, comparable to emergent professional needs or priorities; or establishes the necessities of introducing a totally new one. This ultra basic undertaking presented in the chapter, involves two important operations: description and analysis.

The Concepts of Professional Description and Analysis

"Description", means in this book, numerating the professional behaviors of tasks and acts which embody the performing configuration of a service or product. Numeration of behaviors is done by listing the working steps according to their actual sequence within a job.

Further, description neither concerns itself with spelling out the criteria and environmental conditions of a job, nor with enacting personal and professional characteristics of its personnel. These psycho- practical considerations belong to the sphere of a subsequent effort, that is, analysis(1).

In brief, description is committed primarily to the specification of the behavioral content of a job as it occurs sequentially in actual and professional settings.

Analysis, on the other hand, carries out the burden of several tasks, which are:

1. Screening the behavioral content of a job which was previously accomplished by description. The result of this reviewing mission is acquiring a finalized performing list that is free from any behavioral excesses, and is compensated regading any probable behavioral deficits. The end results of this step are audited clusters of professional acts which are qualified all together to form the practical concept of the required job.
2. Establishing human requirements of a job. This handles all categories of professional personnel necessary for implementation, their personal and working characteristics, interaction and learning styles and behavioral consequences.
3. Establishing the administrative and material characteristics of a job environment. These cover the organizational and operational laws/ rules, administrative instructions, communication patterns and techniques, materials, tools, machinery, facilities and equipment.
4. Establishing the standard interaction patterns among human services and adminisnative laws and instructions, material services, human services, administrative laws.

The Concept of a Job

The concept of a job indulges all professional behaviors which specialize in performing a service or yielding a product. The nature and outcomes of the job could, of course, be of any thing that is deemed useful to an individual or society as a whole.

To understand the job and to be able to deal effectively with its content throughout the design and training, a taxonomy for the classification of professional behaviors is presented. The taxonomy proposes four different mutually inclusive levels: the job (the macro professional behavioral system or framework), the tasks (the sub-jobs within the mother job or the major behavioral undertakings or clusters within the macro job system); the acts (the miniature or micro-behavioral responsibilities within tasks) and the act's behaviors (the finite behavioral steps necessary to perform the act itself). Further exploration of a job concept appears below.

First : The job is a group of behaviors which are specialized in producing a general function, service or product. The job according to its nature and behavioral demands from employees, or in other words, according to its behavioral size, could be of three types: compound, normal, and confined or simple. Astronautics is an example of a compound job. Car driving is seen as a normal job, while laundry is a limited human undertaking.

second: The task is a group of behaviors specialized in producing a major formative function, service or product within the general job.

Complicated or highly demanding jobs like astronautics consists of several tasks, normal jobs as car driving on the other hand, is usually made up of a moderate number of tasks, ranging probably from 3-5. Finally, simple jobs, are also simple in behavioral composition. Laundry for example is composed of one or two tasks at the most.

If car driving is taken as an illustration, the major tasks could be: Driving on road, observance of traffic safety and laws, and car maintenance.

Third : The act represents a main behavior or a major step within a task. A group of acts with a common cause or purpose will lead under normal operating conditions to a behavioral or material end specified by the concerned task. While "driving on road" is an example of a behavioral end, "sewing a dress" is considered a material output.

To further explain the concept of professional acts, the task of "car maintenance" is sliced into the behavioral segments or acts below:

1. Comprehending general acts of car maintenance
2. Appreciating the role of maintenance in safety driving.
3. Reserving battery water to required level.
4. Reserving radiator water to required level.
5. Maintaining engine oil to required level.
6. Reserving wheel oil to required level.
7. Controlling engine temperature to required level.
8. Keeping car lights properly working.
9. Keeping car brakes effectively working.
10. Changing flat car tires.
11. Keeping car locks properly working.
12. Maintaining good cleanliness of car.
13. Changing engine oil every (1000) km.
14. Repairing cause of engine high temperature.
15. Repairing car lights when necessary.
16. Repairing flat car tires.

Fourth: The behaviors that represent the finite behavioral units and which form cluster of the different acts within a task. Hence, they are called formative behaviors, or objectives throughout the text (refer to chapter V and forms 13, 14, 15 & 16).

If act no. 3 in form (3) is taken as an example, its formative behaviors could appear as follows:

1. Lifting the engine cover and securing it.
2. Bringing (or buying) the appropriate fluid from car trunk.
3. Dusting the battery.
4. Opening battery packets.
5. Filling packets with water according to their individual needs.
6. Checking the adequacy of water in battery packets.
7. Closing battery packets.
8. Storing battery water in an appropriate place within the car.

The constitutional and logical relationships of above job components, could be depicted in Figure (1)

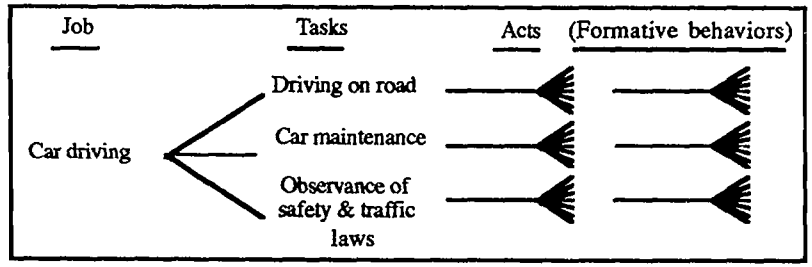


Figure (1): A taxonomy for the classification of a professional behavior.

Professional Needs Assessment of a Job for Renewal

Four main steps are offered for job needs assessment by means of description and analyses. These are :

Numerating and Sorting Job Acts Into Basic & Minor :

Numerating and sorting are processes of a job description aiming primarily at :

1. Providing an operational ground for later task analysis.
2. Specifying objectives of training (as in chapter IV).
3. Specifying topics or content of training.
4. Specifying the sequence of training.
5. Specifying the appropriate training strategies.

For numerating and sorting to achieve the aforementioned goals, the designer should maintain(2):

1. A detailed and complete description.
2. A clear and down to the point description.
3. Internally compatible description, free from any contradictory behaviors in both nature and sequence.
4. Specialized description of job tasks and acts.

This calls for the disclusion of any behavior which does not belong directly to the described task or act.

While the designer may search different sources (summarized in Form (1) for numerating job behaviors, he could adopt for sorting purposes, the following procedures:

First: Holding formal discussions to decide upon two matters (refer to form I) :
1. The necessity of each act for the job.
2. The status of each necessary act within a job: basic or minor?

Second : Consulting a team of job experts. Using the Delphi method(3) in this regard will enable the designer to reach an agreement concerning the two matters stated above.

Third: Selecting a group of competent employees, job supervisors and other professional personnel, then asking each one of them to sort the numerated job acts into necessary and unnecessary. The necessary ones should then be sorted into basic and minor acts.

To ease the above tasks of numerating and sorting job acts, Form (I) below is presented. This form is a primary tool for the design of training , particularly when the following instances are considered:

1. One purpose of training is to update the behavioral content of a job for better performance, service, or product.
2. The job is newly enacted within a local environment.
3. The behavioral content of a job is not finalized, or it is subject to professional doubts.

Regardless of previous instances, the preliminary role of form (I) is to numerate and sort job acts as a fundamental step to analyzing and understanding a job, and as a prelude to the design of training in subseqent forms and chapters.

Form (1): Numerating and sorting job acts into basic and minor.

The job: ..... Designer: .....

Task: ..... Administration: .....

No.S	Job acts	Relevancy of acts (put √ or X)	Basic or Minor	Description summary
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	The designer may write in this category any act believed to belong to the job. He could use for the purpose, sources such as(4): 1. Behavioral realities of the job. 2. Job materials, equipment, machinery, and facilities. 3. Job problems, difficulties... faced by employees. 4. Job descriptions in other countries. 5. Job training literature. 6. Official records and documents of a job. 7. Research studies, reports of a job. 8. Diaries of employees. 9. Work//guidebooks of a job. 10. Job supervisory and maintenance sources. 11. Behavioral lists of a job. 12. Job experts, supervisors, administrators, training committees.	The designer with the help of experts, will determine here the relevancy of acts to a job by putting (√) for relevant ones and (X) for irrelevant ones.	The designer with the help of experts will sort relevant acts into basic and minor ones.	The designer will summarize here any data that could benefit the description and analysis of a job, such as: totals of basic and minor acts; the logical or practical sequence of acts, or other notes which may help the process of designing.
Comments:				

Specifying The Behavioral Nature of Basic and Minor Acts.

Five categories are suggested for classifying basic and minor acts according to their behavioral nature. These are (refer to form 2) : knowledge, application, attitudes, problem solving, and evaluation / guidance.

The proposed five categories of professional behavior are based on two main sources :

Firstly: The study of some specialized references[5] as Bloom et al (1956), Derr (1973), Gagne (1977), Harrow, (1972), and Krathwohl et al (1974).

Secondly : The observation of vocational/ professional acts within real settings.

The basic function of form (2) is sorting job acts according to above five behavioral categories. This is of course an expert estimation by the designer. Despite the fact that it could be viewed as somewhat personal and undisciplined, it is still seen as very effective when dealing with such complex human behavior as in the case of training and skill development.

Professional expertise seems to be the practical and short-cut method to accomplish the judgmental responsibilities of current pursuit.

For sorting basic and minor acts however, the guidelines below, are suggested :

1. More cognition aimed at facts + some affect + some motion ➡ cognitive behavior or knowledge act.
2. More cognition aimed at problem solving + some affect + some motion ➡ problem solving behavior or act.
3. More cognition aimed at evaluation and feedback + some affect + some motion ➡ evaluation and guiding behavior or act.
4. Some cognition + more affect + some motion ➡ affective behavior or attitudinal act.
5. Some cognition + some affect + more motion ➡ psychomotor behavior or application / performance act.

To use form (2), the designer simply writes down the professional acts, keeping throughout their logical and practical sequence within a job.

Form (2): Specifying the behavioral nature of basic and minor job acts.

The job: ..... Designer: .....

Task: ..... Administration: .....

No.S	Job acts	Behavioral natures of acts				
		Know-ledge	Appli-cation	Attit-udes	Proplem solving	Evaluation /guidance
1	Comprehending general acts of car maintenance.	√				
2	Appreciating the role of maintenance in safety driving.			√		
3	Reserving battery water to required level.		√			
4	Reserving radiator water to required level.		√			
5	Maintaining engine oil to required level.		√			
6	Reserving wheel oil to required level.		√			
7	Controlling engine temperature to required level.					√
8	Keeping car lights working properly.					√
9	Keeping car brakes working effectively.					√
10	Changing flat car tire.				√	
11	Keeping car locks working properly.					√
12	Maintaining cleanliness of car.		√			
13	Changing engine oil every (1000) kms.		√			
14	Repairing cause of high engine temperature.				√	
15	Repairing car lights when necessary.				√	
16	Repairing flat car tire.				√	
	Totals	1	6	1	4	4

Classification Summary:

Knowledge : 6.25%
Application : 37.5%
Attitudes : 6.25%
Problem Solving : 25%
Evaluation/Guiding : 25%

Comments:

Signature & date

The designer then classifies each act according to its prevailing behavioral nature: knowledge, application, attitude, problem solving, and evaluation/ guidance.

Afterwards, the designer summarizes in the lower section of form (2), the behavioral data in terms of percentages. The digital results of this step will show the overall behavioral nature of the task involved.

The behavioral and digital data which results by current form, plays a major role in the design of training; since it will enter in whole, form (11) in Chapter IV, and will be indirectly utilized in later forms (13), (16) and many subsequent others.

Assessing Importance Levels of Basic and Minor Acts :

It is time now for the designer to assess the degree of importance each act deserves within a job. This is a very cruicial step for the design and construction of training program (refer to Chapters 5, 6, 7, & 8); and for the evaluation of program validity and productivity in the final chapter of the book.

For assessing the importance of professional acts within a job, the designer may consider the following procedures:

1. Comparing each act with others within a job or a task, adopting, thus, norm-referenced evaluation. The criteria which may guide the decision making process here, are:
   * The time length needed to perform the act . The more time could mean more weight or importance for the act.
   * The number of behaviors involved in performing the act.
   * The implementation difficulty and the multiplicity of performing requirements (rules, tools, materials, facilities and environmental conditions.
   * The occurance of the act within a job. The more occuring act comparable to others, the more important it could be.
2. Administering a questionnaire to a group of job experts, employees, supervisors, evaluators and other competent personnel. Using the Delphi technique coupled with a questionnaire containing basic and minor acts, the designer will ask each member of the group to rate the importance of individual acts for performing the job as shown in form (3).

3. Giving the degree of 4 (out of 4) as highly important; or the degree of 3 as important, for each basic act. The degrees of 2 and 1 as moderate and limited (low) importance for each minor act, whenever the designer lacks the experience or the environment to use the two procedures above.

The end results which are achieved here will suffice for the asessment undertaking required by the current designing stage of training. This undertaking could be operationalized by the use of form (3).

Form (3) plays a fundamental, analytical role in the design of training. It summarizes the estimated importance levels of acts, which in turn will be recorded later in forms (9) and (10) of chapter IV.

To use form (3), the designer first writes down the basic and minor acts according to their logical and practical order within the job. Secondly, he or she estimates professionally (probably with a help from experts) the degrees of importance of each act in producing the a job, considering in this regard the criteria stated previously.

Nonetheless, the designer could, whenever necessary enlarge the form to hold more acts. He could, moreover, divide the form into two: the first for basic acts and the second for minor acts.

While estimating the importance of acts, the designer may resort, if necessary, to dropping minor acts which rate low (1) on the scale. This is due most likely, to both their marginality in implementing the job, and time limitation imposed on him.

Analysing Job Constituents And Implementation Requirements for Renewal and Training Needs.

Job constituents and implementation requirements consist of professional behaviors, personnel, administrative , operational laws, materials, tools, machinery, facilities and equipment. Form (4) is offered as a summary analytic tool for the purpose of accomplishing the present step.

Form (3): Assessment of importance levels of basic and minor acts within a job.

The job: ..... Designer: .....

Task: ..... Administration: .....

Types	No.s	Job acts illustrative examples	Importance levels of acts						
			Nil (0)	Low (1)	Moderate (2)	High (3)	V. High (4)	Digital Degrees	Notes
Daily / BAsic acts or Characteristics	1	Comprehending general acts of car maintenance.				√		3	
	2	Appreciating the role of maintenance in safety driving.			√			2	
	3	Maintaining battery water to required level.					√	4	
	4	Maintaining radiator water to required level.					√	4	
	5	Maintaining engine oil to required level.					√	4	
	6	Maintaining wheel oil to required level.				√		3	2+12+28 / 12
	7	Controlling engine temperature to required level.					√	4	
	8	Keeping car lights working properly.				√		3	= 42 / 12
	9	Keeping car brakes working effectively.					√	4	
	10	Changing flat car tire.					√	4	= 3.5
	11	Keeping car locks working properly.				√		3	
	12	Maintaining cleanliness of car.					√	4	
		Basic acts' subtotals			2	12	28	42	The mean 3.5
Sporadic / Minor acts	1	Changing engine oil every (1000) kms.			√				
	2	Repairing cause of high engine temperature.			√				
	3	Repairing car lights when necessary.			√				
	4	Repairing flat car tire.		√					
		Minor acts' sub-totals		1	6			7	The mean 1.75

Form (4): Analyzing job constituents & implementation requirements.

The job: ..... Designer: .....

Task: ..... Administration: .....

Location : .....

Type of service/product : .....

Personnel (numbers & qualifications): .....

Administrators / Supervisors: .....

.....

.....

Employees : .....

.....

.....

.....

Support services : .....

.....

.....

Administrative / Organizational laws & rules : .....

General work laws : .....

.....

Rules & qualities of job implementation : .....

.....

.....

Work schedules .....

.....

Total time consumed : .....

Implementation sequence: .....

.....

.....

follows

Follows : Form (4)

Overall product : _____

_____

Physical & psychological milieu : _____

Facilities : _____

_____

Equipment : _____

_____

Machinery / Tools _____

_____

Raw & fabricated materials : _____

_____

_____

Communication mechanisms : _____

_____

Interaction styles : _____

_____

Supervisory techniques : _____

_____

Leadership styles : _____

_____

Criterion behaviors of a job (type & frequency within a job) :

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Additional notes : _____

_____ Signature & date

In using form (4) the designer should take into consideration the following :

1. Recording the behavioral acts by different observers on several occasions. This may lead to a valid job description.
2. Dividing the form, if necessary, to several subforms. Each is specialized to record specific factors such as: personnel and support services, administrative routine, physical and psychological requirements, standard professional behaviors or acts, and so on.
3. Specifying all the details concerning the implementation factors as to their types or categories, characteristics, qualifications, qualities, roles, work conditions, strengths and weaknesses, and end products. The designer with all these specifications may find himself in need of introducing more sub-forms than what is recommended above. He should not hesitate to do so, since such action will benefit the scientific design of training.

The data of form (4) is utilized directly by form (7) in chapter III and form (11) in chapter IV, and other forms in subsequent chapters. This major designing role of form (4) stems from its comprehensive nature as descriptive and analytic mechanism which helps in understanding the job and in sorting its renewal / training needs.

What Comes Next ?

The following chapter concerns itself with needs assessment of a job for renewal and/or training. This important task of designing professional development programs is accomplished by means of description and analysis and the use of four forms specially constructed for the chapter.

The cycle of professional needs assessment could not be complete without the description and analysis of organization and employees.. The next chapter will undertake this responsibility.

Chapter III

Professional Needs Assessment of Organization and Employees

Introduction

Professional needs assessment of organization and employees, as in the case of a job, is accomplished by description and analysis of their status for the purpose of determining renewal / training needs.

Description is primarily a counting process of all human, psychological , behavioral, organizational and material components which formulate the concepts of organization or employee.

Analysis on the other hand, is the process of finding the interactive-working relationships among described components, coupled with their roles, conditions and environents which together form the professional configuration of the organization or the employee. Analysis helps further in understanding the status of organization or employee and the effective ways of communicating / interacting with them for purposes of work and development .

The Concept of Organization

The organization is a team of professional individuals who work harmoniously together in accordance with declared roles and behavioral systems to achieve meaningful ends: services or products.

Moreover organization, is founded within a society by an individual or group of investors as a private enterprise; or by the public as the case of governmental or common cause agencies. Both types, of course, have specific categories of employees to accomplish specified services or products. This to say that organization owns characteristically both employees and the job.

Administratively, however, the organization could be defined as a pyramid of behavioral communicative system with a director or a general administrator / manager situated at its top, while at the base, the employees, technicians, secretarial and maintenance services are operating.

At the middle of this pyramid, job supervisiors, second and third level administrators are placed. These personnel serve, beside carrying out the to and fro communications of head administrators and workers, as a mediating mechanism between the work force on one side, and the customers on the other.

Considering above, the organization is a compound human and functional system which is composed mainly of the following :

1. The human component which includes all professional personnel such as: administrators, experts; employees, technicians, secretarial and maintenance services; and last but not the least: the customers.
   Customers are considered here an integral part of any organization as is the case of administrators and employees. Without customers, the existance of an organization will be automatically nullified.
2. The administrative/organizational component which embodies the laws, rules, instructions and principles of communication, interaction and operation. These elements are very essential for steering human and material services, while are performing the required duties or products.
3. The professional behavior component which represents the total services/ products that the organization yields to the public or to its customers.
4. The material component which is basically made of: work facilities, equipment , machinery, tools, raw/prefabricated. materials, media, technologies and financial budget.

The four components above are depicted in the behavioral system below (figure I) :

The Concept of an Employee

The employee, in the broader sense, is the generator of all things, services, or products needed by a society - whether these are rearing offsprings, educating children, manufacturing specific products, or performing services necessary for daily life.

The employee therefore, should be treated as a priceless human asset that any society may have. His personal and professional integrities must be constantly preserved. Whenever he is degraded or his

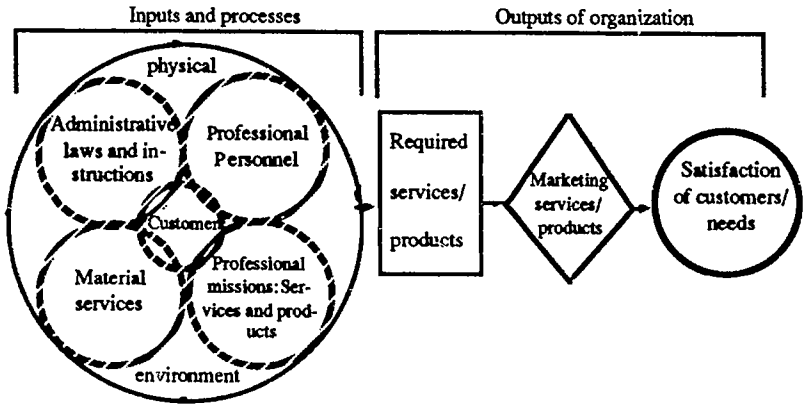


Figure I : The organization as a compound operational system.

energies are wasted, the stability / maintenance of society's presence, as well as the realization of the future, may be compromised.

As an artisan however, the employee is a human adult who is professionally qualified to work with others for the purpose of accomplishing a job (service or product) through which he could fulfill his individual/family needs. The growth of an employee requires as the case of any human being, a systematic intake of new constructive experiences.

The above definition of employee has several implications :

First: The employee is a human being. This human being, due to his sophisticated personal, physical, social, cognitive, affective, and psychomotor qualities, represents the ultimate master of animal life.
Thus, an employee reguires, by nature, positive, human and civilized treament throughout work and training. Maslow's heirarchy of human needs, Cronbach's classification of needs, and Muray's psycho-genic needs, provide examples of what could be applied here.

Second: The employee is an adult. This means that he, as a human being, is also a grown individual with different life experiences, values, communicative skills, personal aspirations and obligations.
This emphasizes the fact that the employee as an adult comes normally to training with a mature personality which possesses a stable behavioral framework. Hence , the principles, theories and principles of andragogy must be employed here.

Third: The employee is a professionally qualified individual, specialized to perform a specific work responsibility.
This indicates that an employee is not an outright ignorant professional; rather he has already some qualifications which training could build upon, while some other skills or characteristics must be developed or updated by him. This will enable the designer to respect the employee's time, needs and efforts, by giving him only what he needs; thus, leading to a valid professional program which is eagerly sought in training. Hertzberg's motivation-hygiene theory may apply to the present employee's element.

Fourth: The employee is a social creature who is capable of coexisting and working with others for the betterment of himself and his fellow women/men. The principles of sociology, social psychology and human interaction / cooperation, should be applied whenever training is recommended for him.

Fifth: The employee is dependent upon the returns of his job whether these are monthly salaries for a service, or benefits of commercial products. This principle could be exploited as a convincing motivational factor for the employee to be actively involved in the act of training; and to be more productive while performing his job in the future.

Sixth: The employee is a growing human being. This means that while he possesses initial professional experiences of the job,he still needs more new experiences as a growing individual, encountering almost every day novel work and life situations. These of course could be made available to him by means of training and professional development programs.

Professional Needs Assessment of Organization and Employees for Renewal / Training

Training handles all behavioral aspects, skills and characteristics which could be developed by means of professional programs. The duration of these programs may be a day, some days or weeks, or in other cases may last to several months or even for a year or two. The programs could be presented by forms of courses, intensive workshops, training working sessions, counseling interviews, T. groups and organized guidance.

Renewal on the other hand, is concerned in this book, with material needs of employees and organization. These needs are fulfilled normally by means of purchase, leasing, maintenance and repair.

Assessment of professional needs for renewal / training involves three major steps, explained as follows:

Describing and Analysing Behavioral/ Characteristic Givens of Organization.

The behavioral / characteristic givens of an organization as stated earlier, are of four types: human, administrative, behavioral, and physical constituents.

To describe the four constituents of an organization, the designer may adopt form (5) for surveying them as exiting in reality . The designing role of form (5) therefore is numerating the qualities, behaviors, characteristics or professional qualifications of each component.

The form allows further for the conduct of elementary analysis of the aforementioned constituents of an organization. The data of the form will enter the next one, form (6) for digital analysis.

The results of form (5) are recorded within four categories :

* Incompletely available elements (-)
* Completely available elements (≅)
* Excessively available elements (+)
* Compeletly missing elements (.)

If employees are taken as an example then the following cases may be observed as a result of their description and elementry analysis:

Form (5): Description and elementary analysis of an organization.

The job: ..... Designer: .....

Task: ..... Administration: .....

Organizational constituents (illustrative examples)		Current status: Available -	Available ≅	Available +	Nill (.)	Notes
Human constituents : A. Working employees. B. Administrators. C. Personnel of support services. D. Customers.						When using the form, the designer considers the following: (1) Developing various independent forms for different constituents due to details which may pursue to maintain a clear picture of each constituent. (2) Putting (√) where constituents are observed completely (≅); incompletely (-) or excessively (+); and (.) when it is missing. (3) Specifying current status and/ or qualifications observed for each constituents in this colum.
Job constituents:	Totals					
A. Operating acts. B. Administrative acts.						
Administrative constituents:	Totals					
A. Laws, rules & decrees. B. Instructions. C. Work/human relations. D. Reward-punishment policies. E. Work schedules. F. Files and records.						
Physical constituents:	Totals					
A. Facilities. B. Equipment. C. Machinery & tools. D. Raw materials. E. Pre-fab. materials. F. Budget.	Totals					

Description summary

A. Completely available elements. (≅)
B. Incompletely available elements. (-)
C. Excessively available elements. (+)
D. Completely missing element. (.)

Signature & date

1. Employees who are incompletely available, when :
   * there are 90 employees instead of 100 actually needed by an organization (quantitative incompleteness).
   * there are four categories of employees, while the organization needs five ones (qualitative class incompleteness).
   * there are 100 employees needed by an organization, some of them have to undergo specific professional improvement (qualification incompleteness).
2. Employees who are completely available, when there are 100 which are congruent in their qualifications and qualitative classes with what is required by the organization.
3. Employees who are totally missing from the organization as an extreme negative case or when organization and job are newly initiated within an environment.
4. Employees who are excessively available, when there are 115 while the organization is in need of 100.

Digital Analysis of Organizational Needs for Renewal/ Training.

The behavioral/ characteristic data of form (5) is treated more statistically in this step by form (6). The designer could accomplish this task by comparing observed data with criterion data already available to him. This will result in quantitative values marked by (√) in the appropriate columns of the scale.

While the digital data statistically pinpoints the missing, excessive, inadequate and satisfactory constituents of the organization, two major needs may arise:

Firstly : The materialistic needs which could immediately be met by means of leasing, purchasing, repair, maintenance, omission or addition, and;

Secondly : The human needs that should be fulfilled by training. These different needs however, will enter forms (9 and 10) for integration with employees and job needs, in order to achieve an articulated list for training.

Describing and Analyzing Employees for Renewal / Training.

When describing and analysing employees, several factors should be examined:

1. Personal characteristics, e.g. physical features, endurance and abilities, age, sex, achievement background, reading and writing levels, flexibility, general/ special intelligence, perseverance and concentration abilities, psycho-social moods, and motivational qualities.
2. Professional skills which are concerned with performing a mandated job, service, or product.
3. Life and work experiences.
4. Learning/ achievement styles.
5. Communication/ interaction styles.
6. Personal/ private concerns.
7. Economic and social family status.

To accomplish the current step with the designing pursuits embodied in it, four alternative forms (7 a and b, 8 a and b) are presented. Form (7 a) includes professional acts or behaviors, their criterion and observed performances and the resulting training needs. Form (7b) on the other hand, is concerned primarily with personal characteristics/ behaviors and qualifications.

When designing training, the designer writes job acts or behavicrs together with criterion performances or grades that should be manifisted by the individual employee, as measures of his professional adequacies.

The designer then observes the employee, giving him the grades or mark values which he deserves. Comparing now the criterion data with the observed, the designer could easily pinpoint the professional needs that should be adopted for training.

To use form (7 b), above, certain procedures apply. As the form, however, is specialized in personal needs, the designer writes down the criterion qualities, characteristics or behaviors. Observing employees afterwards and assessing how they rate, comparable to what is required, will produce again the renewal/ training needs that should be fulfilled by future programs. Finally, forms (8 a & b) are detailed versions of forms (7 a and b). They are constructed to accomodate form

Form (6): Extended digital analysis of organizational needs for renewal/ training.

The job: ..... Designer: .....

Task: ..... Administration: .....

Organizational constituents (illustrative examples)		excessive +	Assessment of current status 10	9	8	7	6	5	4	3	2	1	Nil 0
Human constituents:		√											
A. Working employees.		√											
B. Administrators.			√										
C. Personnel of support services.											√		
D. Customers.													
Job constituents :	Totals	2	1								1		
A. Operating acts .						√							
B. Administrative acts .								√					
Administrative Constituents:	Totals					1		1					
A. Laws, rules & decrees .					√								
B. Instructions.						√							
C. Work human relations .													√
D. Reward-punishment policies.												√	
E. Work schedules .											√		
F. Files and records .										√			
Physical Constituents	Totals				1	1				1	1	1	1
A. Facilities.									√				
B. Equipment .										√			
C. Machinery & tools .													√
D. Raw materials .								√					
E. Pre-fab. materials .									√				
F. Budget.							√						
	Totals						1	1	2	1			1

Analysis Summary :

A. Addition needs (Missing elements) :

1. Work relations.
2. Machinery.
3.
4.
5.
6.
7.
8.
9.
10.

B. Omission needs (excessive elements)

1. Employees.
2. Administrators.
3.
4.
5.
6.
7.
8.
9.
10.

C. Renewal needs

1. Laws/rules.
2. Instructions.
3. Work schedules.
4. Files & records.
5. Budget.
6. Facilities .
7. Equipments
8. Raw materials .
9. Prefab. materials .
10. Reward-punishement policies.

D. Training Needs:

1. Work relations.
2. Operating acts.
3. Administrative acts.
4.
5.
6.
7.
8.
9.
10.

Form (7 a): Description and elementary analysis of employees' preformance.

Employee: ..... Designer: .....

Job: ..... Administration: .....

Organization: ..... Date: .....

No.S	Professional acts or behaviors (illustrative examples)	Criterion Performance	Observed Performance	Training Needs
1	Comprehending general acts of car maintenance.	B	C*	1 degree
2	Appreciating the role of maintenance in safety driving.	B	C	1 degree
3	Maintaining battery water to required level.	A	D	3 degree
4	Maintaining radiator water to required level.	A	C	2 degrees
5	Maintaining engine oil to required level.	A	D	3 degrees
6	Reserving Wheel oil to required level.	B	C	1 degree
7	Controlling engine temperature to required level.	A	D	3 degrees
8	Keeping car lights working properly.	B	C	1 degree
9	Keeping car brakes effectively working.	A	D	3 degrees
10	Changing flat car tire.	A	D	3 degrees
11	Keeping car locks working properly.	B	C	1 degree
12	Maintaining cleanliness of car.	A	B	1 degree

Comments :

* Grades are illustrative examples.

* Generally after : Turell, M. Training Analysis- A Guide to Recognization Training Needs. Plymowth, England : Macdonald and Evans, Ltd, 1980.

Form (7 b): Description and elementary analysis of employees' personal characteristics/behaviors.

Employee: _____ Designer: _____
Job: _____ Administration: _____
Organization: _____ Date: _____

No.S	Personal characteristics/ behaviors (illustrative examples)	Required characteristics or behaviors	Observed characteristics or behaviors	Renewal/ Training Needs
1	Comprehending general acts of car maintenance.	10*	7	3
2	Appreciating the role of maintenance in safety driving.	10	7	3
3	Maintaining battery water to required level.	9	2	6
4	Maintaining radiator water to required level.	8	3	5
5	Maintaining engine oil to required level.	12	5	7
6	Maintaining wheel oil to required level.	6	3	3
7	Controlling engine temperature to required level.	15	5	10
8	Keeping car lights working properly.	7	4	3
9	Keeping car brakes effectively working	12	2	10
10	Changing flat car tire.	14	3	11
11	Keeping car locks working properly.	5	3	2
12	Maintaining cleanliness of car.	10	7	3

Comments :

* The numbers of characteristics or behaviors are illustrative examples.

Form (8 a): Digital analysis of employees' needs for renewal/training based on their pre-performance.

Employee: _____ Designer: _____
Job: Car driving Administration: _____
Organization: _____ Date: _____

Types	No.s	Professional acts (illustrative examples)	observed pre-training performance & accruing needs						
			Nil (.)	L (1)	M (2)	H (3)	V. H. (4)	The needs	Notes
Daily / BAsic acts or Characteristics	1	Comprehending general acts of car maintenance.				√		1	
	2	Appreciating the role of maintenance in safety driving.			√			2	
	3	Maintaining battery water to required level.		√				3	
	4	Maintaining radiator water to required level.		√				3	
	5	Maintaining engine oil to required level.	√					4	
	6	Maintaining wheel oil to required level.		√				3	
	7	Controlling engine temperature to required level.	√					4	
	8	Keeping car lights working properly.			√			2	
	9	Keeping car brakes working effectively.	√					4	
	10	Changing flat car tire.	√					4	
	11	Keeping car locks working properly.			√			2	
	12	Maintaining cleanliness of the car.			√			2	needs mean
		Basic acts' sub-totals	0	3	8	3		34	2.83
Sporadic / Minor acts	1	Changing engine oil every(1000) kms.				√		1	
	2	Repairing cause of engine high temperature .			√			2	
	3	Repairing car lights when necessary				√		1	
	4	Repairing flat car tire .				√		1	needs mean
		Minor acts' sub-totals			2	9		5	1.25

Form (8 b): Alternative digital analysis of employees' needs for renewal/ training based on their pre-performance.

Employee: _____ Designer: _____
Job: Car driving Administration: _____
Organization: _____ Date: _____

Types	No.s	Professional acts (illustrative examples)	Observed needs for training / renewal						
			Nil (.)	L (1)	M (2)	H (3)	V. H. (4)	The needs	Notes
Daily / BAsic acts or Characteristics	1	Comprehending general acts of car maintenance.		√				1	
	2	Appreciating the role of maintenance in safety driving.			√			2	
	3	Maintaining battery water to required level.				√		3	
	4	Maintaining radiator water to required level.				√		3	
	5	Maintaining engine oil to required level.					√	4	
	6	Maintaining wheel oil to required level.				√		3	
	7	Controlling engine temperature to required level.					√	4	
	8	Keeping car lights working properly.			√			2	
	9	Keeping car brakes working effectively.					√	4	
	10	Changing flat car tire.					√	4	
	11	Keeping car locks working properly.			√			2	
	12	Maintaining cleanliness of the car.			√			2	needs mean
		Basic acts' sub-totals		1	8	3		34	2.83
Sporadic / Minor acts	1	Changing engine oil every(1000) kms.		√				1	
	2	Repairing cause of engine high temperature.			√			2	
	3	Repairing car lights when necessary		√				1	
	4	Repairing flat car tire.		√				1	needs mean
		Minor acts' sub-totals		3				5	1.25

(3) and its processes of analysis and the specfication of employee's needs for renewal/ training.

Forms (8 a & b) like (3) sort job acts or professional qualifications into basic and minor, and have categories for statistical sub-totals and means of training needs. The forms could also be enlarged to hold more needs than are already indicated.

The data from forms (7 a & b) may be utilized by forms (8 a & b) for more statistical manipulation. The two sets of forms may be used independently or in substitute for one another. Regardless of the designing role which the forms may play, their data will enter directly onto forms (9 & 10) in chapter IV, and then indirectly onto later forms, particularly those of (11, 12 and 13) in chapter IV and V.

What Comes Next ?

The cycle of professional description and analysis of job, organization and employees, is now complete. The renewal/ training needs of each factor by this designing stage, are properly identified.

The next logical step will be the unification of these tri-needs into one list, in order to be adopted as the nucleus of the coming professional development program. Chapter IV is specialized in this task.

Chapter IV

Unifying Professional Needs And Establishing Behavioral Digital Bases of Training Design

Introduction

The proposed approach in the book for the design of training, is built upon two main facts: the behavioral nature of program's content which is apt to observation, measurement and accountability; and the accessibility of this content to digital manipulation. The lack or weakness of these givens will deprive the designing approach, its identity and working substance.

This chapter, therefore, lays out the foundations for the behavioral and digital design of training, starting with unifying professional needs of the employees, the organization and the job which were obtained in chapters II and III.

Training/ Renewal Needs of Employees, Organization and Job : A brief Illustration

Professional needs of the employees, the organization, and the job could be grouped in two classes: physical / material and psycho-behavioral. The first is concerned with renewal, while the second with training. The following are notes regarding these needs :

Material Renewal Needs:

Material renewal needs include: the introduction of new types of employees, media, technologies, facilities, equipment, machinery and tools, administrative rules and instructions; or the modification of existing administrative and material services, which are essential, for updating, increasing, expanding or improving the professional services / products.

The above various needs could be fulfilled by several procedures such as: recruitment of employees and other human services as well as purchase, leasing, repair or maintenance of material services.

Psycho-Behavioral Training Needs:

These needs which focus on the development of professional behaviors by means of training, could be classified further into two categories:

The psycho-personal needs:

* Psycho-behavioral problems or needs
* Somatic needs
* Family-social needs
* Economic needs
* Private-personal needs
* Motivational (attitudinal-belonging) needs
* Communication-interaction needs.

The above needs do not call for conventional training, as much as for guidance and clinical programs which may prove very effective in dealing with psycho-personal, social, family, interaction and economic needs.

For the attitudinal-belonging needs; T.groups, psychoanalysis, personal persuasion and interviews could be useful in developing the individual adaptation and belonging to his working environment and satisfaction with job.

Professional performance needs :

The present needs concern themselves with the generation of specific services or products that are expected from professional personnel. Training programs which could meet these needs, are of three types:

* Programs for training employees (or workers).
* Programs for training administrators.
* Programs for training support services.

The training needs of each category above also embody, those of the organization and the job. However, coordinating the three types of needs, will result in a unified list that is valid for prospective training program. This task is presented in the next paragraph.

Unifying Professional Needs of The Employees, The Organization and The Job

The professional needs of the employees, the organization, and the job are treated previously in chapters II and III, by the utilization of eight forms (1-8). Form (9) in this chapter is an elaborated tool representing simultaneously the three varied needs together.

The use of current form does not limit to training needs, rather it is extended to all human and material needs. Hence, the form serves the two major needs :

* Behavioral improvement by means of training .
* Material renewal by means of purchase, repair, maintenance, leasing, recruitment of human services, and enacting or re-enacting administrative / work laws, rules and instructions .

Moreover, it should be noted that the form is not concerned primarily with the observed degrees of needs accrued by chapters II and III. Instead, it focuses on the types of needs per se that are observed for the employees, the organization and the job, then unifies them all in one trainable list.

The form thus serves two purposes :

The first is reiterating professional needs in chapters II and III with the assurance of not missing any of them, and enriching the list by adding new ones whenever it is appropriate.

The second, is the integration of all professional needs of the employees, the organization and the job in one comprehensive list suitable for adoption in training.

Unifying professional needs in this step however, is accomplished by conducting mutual comparisons and analyses among three professional variables: the employees, the organization and the job needs. It is suggested here that the designer may begin comparing job needs with employees' needs. The result will be an integrated and comprehensive list of needs for the organization, the employees and the job.

This comparison between the two need sets of the employees and the job is considered a basic task for the designer to maintain: since the two factors interact directly together to bring about the desired service or product which the organization fosters. While the employees and the job play an operating role to generate the mandated profession, the organization works as an administrative/ supervisory mechanism to guide the professional performance to its ultimate ends. The behavioral and economic interests of the organization therefore lies in the very existence of both the employees and the job.

Further, the designer could of course, perform a short-cut unification of professional needs by adopting either the organization's or the employees' list. This suggestion stems from the fact that while the organization owns both the employees and the job, the employees in

Form (9): Unifying needs of employees, organization and job.

Employee: ..... Designer: .....
The job: ..... Administration: .....
Organization: ..... Date: .....

Organization's Needs	Employees' Needs	Job Needs
Human Resources (1) Working employees. (2) Administrators. (3) Personnel or support services. (4) Customers. **Job performance** (1) Operating acts. (2) Administrative acts. **Administrative requirements** (1) Laws and rules. (2) Instructions. (3) Work-human relations. (4) Work schedule. (5) Reward-punishment policies. (6) Files and records. **Material requirements** (1) Facilities. (2) Equipments. (3)Machinery/tools. (4) Raw materials. (5) Pre-fab. materials. (6) Budget.	**Professional behaviors of:** (1) Operating acts. (2) Administrative acts. (3) Support services acts. (4) Human-enviromental interaction acts. **Human, Social economic needs of:** (1) Work motivation. (2) Personal characters. (3) Personal interests. (4) Social family life. (5) Economic status. (6) Professional growth. **Adult Needs of:** (1) Communication styles. (2) Learning styles.	**Behavioral requirements of:** (1) Operating acts. (2) Administrative acts. (3) Technical/maintenance acts. (4) Secretarial acts. (5) Handling/marketing acts. **Administrative requirements of:** (1) Work sequence. (2) Work schedules. (3) Work laws & rules. (4) Work instructions. (5) Work climate. (6) Supervisory methods. (7) Product service specifications. **Material requirements of:** (1) Facilities. (2) Equipment. (3) Machinery. (4) Raw materials. (5) Pre-fab. materials.

turn operate the organization and the job. The needs of one party therefore is expected under normal work conditions, to encompass those of others. It should be emphasized however that the other two lists of needs must serve as validating tools to finalize the adopted one of the trio.

To complete the unification task of training needs, nonetheless, the designer now reviews the final list which has resulted from the organization's and/or employees' needs, and checks its elements against the job needs. The purpose of this examination is to obtain a refined and conclusive list of professional needs that is responsive to job requirements and is valid for training.

Finally, the designer might use the computer for easing the complex and tiresome tasks of comparison and analysis. The data which results from this step will enter the following forms (10 and 11), leading consequently to the design of the prospective training program within the following chapters (5-9).

Transforming Unified Needs Into Professional Tasks and Acts

The classification of professional behaviors into job task and acts was treated in chapter II. However, if these training components are not available to the designer, then he may consider here the following steps :

1. Detailing training needs into behaviors or acts, applying in this regard the principles and practices stated in chapter II.
2. Sorting the behaviors or acts into homogenious groupings, classes or categories, each is specialized in performing/administring a sub-service or sub-product, or serving a generic professional goal. Every behavioral grouping could be called then, a task with a specific title. The designer should continue this process until the last behavior or act is classified.
3. Grouping the tasks which serve one professional aim under an appropriate title of a job.
   If "car driving" is taken as an illustration, then all the driving behaviors or acts on the road are put together in one task, that is, driving on the road. And, further tasks of "driving on the road", "car maintenance" and observance of safety & traffic laws" are lumped into one job: "car driving" (refer to chapter II for details).
4. Sorting the acts within each task into basic and minor, then sequencing them according to their actual performance.
5. Writing the tasks and their acts in form (10) next, specifying their training degrees within the coming program, based on data of forms (3 and 8) in chapters II and III.

Assessment of Field Time Necessary For Implementing Job Acts

Time is probably the most precious "matter" that man ever has. Within it, man lives his life, and measures the changes or progressions which he encounters in life. For work and training on the other hand, time is viewed as highly critical, since it :

* Helps in understanding current professional and training status, by describing the characteristics and needs of their present.
* Helps in understanding the prospective professional and training status, by projecting desired changes that will take place in the future.
* Carries out the professional and training activities to their behavioral ends ... carries the present to its desirable future.

Professional field time means in this book, the total minutes/hours which an employee normally consumes to yield a service or product. This time is usually available in job written resources such as work/ guide or supervisory books, administrative files/ records and many others.

When field time however is unknown to the designer, then he may determine it by two procedures :

Observing and Measuring Employees' Performance, by :

1. Selecting randomly a sample of employees for observation. The sample could comprise three performance levels: grade (C) employees, grade (B) employees and grade (A) employees. Principles and techniques of random sampling are widely detailed in statistical books.
2. Observing the group sample while accomplishing the required acts by using appropriate forms or tools. Form (4) in chapter II may partly be utilized here. The designer, nonetheless, makes sure to record the beginning and finishing performance time for each employee.

3. Summing up the time periods observed for the group sample, then dividing it by the number of employees involved. The result will be the time mean needed generally to implement the observed professional behavior.
4. Summing up all the time mean obtained for the professional acts which belong to specific task. The result here will be the criterion field time necessary for performing the task.

Since a job is composed of two or more tasks, then the total time needed to accomplish the tasks will lead to the grand working time of the whole job.

Interviewing a Selected Group of Job Personnel:

Examples of job personnel whom may be interviewed, are: administrators, supervisors, experts, employees, technicians and aides. Using this procedure, the field time may be determined in three steps:

1. Selecting a group sample of exceptionally successful job personnel. The sample is expected to be more capable in giving valid assessment of field times than their counterparts, the negligent peers.
2. Asking each group member about two types of field time. The first is the shortest which is needed by (A) employees ; and the second is the longest which is needed by (C) employees.
3. Calculating the time mean for each individual on each act, and the time mean of the act for all sample members. Summing time means for all acts involved in a task or a job, will produce the grand performance period.

One way to check the validity of working time values to the actual requirements of the job, is adopting simultaneously the two procedures above. Correlating time values afterwards will pinpoint the precision reality of results.

Assessment of Training Percentages of Acts and Their Parallel Amounts of Time Within a Program

Training percentages are behavioral or working weights designated

within a program to the development of the job acts based on their importance degrees or levels stated in form (3) and (8) within chapters II and III.

The parallel training time on the other hand, is the program's subperiod allocated for each act based on its training weight or percentage points within the program. Form (10) explains these statistical manipulations.

The behavioral and digital data recorded in columns (1, 2, 3, 4, and 5) of form (10), is taken normally from previous forms (3, 6, 8 and 9) in chapters II, III and IV.

When assessing the training percentages and their parallel periods of time, the designer faces actually two major tasks:

First: Finding the training percentage points of job acts.

To find the training points or percentages within coming program, the designer simply multiplies the degrees of employee's needs (in column 4) by their counterparts of the job (in column 5). The results of this step appear in column (6) of form (10).

The numerator value of each observed act, when is divided by its denominator value, will represent the training percentage or weight which will withstand in the program. It also indicates the time, money, human and logistical services that should be allocated for it throughout training.

Comparing for example the percentages of acts: the first (19%), the third (75%), the fifth (100%) and the eighth (50%), will pinpoint the differential treatment suitable for each act above.

Second: Finding the training time suitable for job acts. The designer could use the following procedures :

Finding the Criterion Training Time for Job Acts When Field Time is Known.

To calculate the training time of job acts, the designer should have in hand the field time of each act. The question of this is settled in the previous paragraph.

Now, to obtain the training time for an act, the designer mutiplies its professional field period by four. The resulting value will represent the criterion time which could be adopted by prospective training programs.

The question that may arise here, is : why should the designer mul-

From (10) : Assessment of training percentages of acts and their parallel amount of time within program.

The Job : car driving Designer : .....

The task : car maintenance Administration : .....

Types	Nos.	Professional acts (illustrative examples)	Degrees of Employees needs [1]	Degrees of Job needs [2]	Training weights within program	
					Points	Minutes
Daily / BAsic acts or Characteristics	1	Comprehending general acts of car maintenance.	1	3	3/16	2③/10
	2	Appreciating the role of maintenance in safety driving.	2	2	4/16	5/20
	3	Maintaining battery water to required level.	3	4	12/16	30/40
	4	Maintaining radiator water to required level.	3	4	12/16	30/40
	5	Maintaining engine oil to required level.	4	4	16/16	30/30
	6	Maintaining wheel oil to required level.	3	3	9/16	11/20
	7	Controlling engine temperature to required level.	4	4	16/16	60/60
	8	Keeping car lights working properly.	2	3	6/16	20/40
	9	Keeping car brakes working effectively.	4	4	16/16	120/120
	10	Changing flat car tire.	4	4	16/16	120/120
	11	Keeping car locks working properly.	2	3	6/16	11/30
	12	Maintaining cleanliness of car.	2	4	8/16	30/60
		Basic acts' subtotals	34	42	124④/192	469/590
		means & percentages	3	3.5	65%	79.5%
Sporadic / Minor acts	1	Changing engine oil evey (1000) kms.	1	2	2/16	5/40
	2	Repairing cause ohigh engine temprature .	2	2	4/16	15/60
	3	Repairing car lights when necessary	1	2	2/16	8/60
	4	Repairingflat car tire.	1	1	1/16	4/60
		Minor acts' sub-totals	5	7	9/64	32/220
		Means & percencetages	1.25	2.75	14%	15%

(1) From form (8). (2) From form (3). (3) Criterion training time. (4) Grand total of observed needs of acts 3-12 =117. (5) Minutes are based on the multiplication of pencentage points in column (6) by criterion training time in column (7). The result is the total appropriate period for training.

tiply the field time by 4 in order to get the criterion training time? The justification is as follows:

The achievement of behavioral skills whether in training or in formal education, requires four basic processes: teaching, learning, practice/ internalization, and evaluation-correction. Each process necessitates a specific period of time comparable to other accompanying processes.

It is assumed here that normal trainees, under normal training conditions, will consume normal comparable periods of time for teaching, learning, practice and evaluation. With the same token, bright trainees will need shorter comparable periods to go through each one of the aforementioned activities.

According to the above, if the job time of act (1) in form (10) is for example 2.5 ms., the criterion training time will be: 2.5 x 4 = 10 ms.

Finding the Observed Training Time for Job Acts based on Their Criterion Training Times and Percentage Points.

Based on the criterion training time of 10 ms. , what will be, then, the observed training time necessary for act (1) in form (10)? looking at the percentage points of the act, it is found to be 19% (or 3/16). The program time required for training on the act, is therefore: 10 x = 2 ms. The same operation applies of course to other remaining acts. Minutes data in form (10) results from this procedure.

The use of form (10) in the design of training, presents several indicators for training :

(1) Low-key acts indicate either employees master already $\frac{3}{16}$ required skills to a large degree, or the acts themselves embody minor abilities used to perform the job.
In both cases, the designer allocates appropriate time for reviewing and stimulating past knowledge of the acts.

(2) Highly needed acts are important for both employees and the job; in addition, these acts are missing from professional repertoire of employees. Acts (3-12) stated in form (10) constitute in essence the core of the training program.

(3) The amount of time appropriate for the training on each act, and for the whole program in general. Form (10) pinpoints digitally these two dimensions of training time (Column 7) .

Finding the Observed Training Time for Job Acts When Criterion Time or Percentage Points are Known and Specific Period for the Program is Pre-determined.

What about, if either the criterion time or percentage points are known and the training time is predetermined by the concerned administration? How could the designer calculate the time periods suitable for acts, without overlooking or overweighing one or more of them at the expense of others ?

> **Rule :** If the available time is clearly short comparable to the actual demands required under normal conditions for training, the designer is obliged to disregard the low-key acts, thus distributing the available time on the remaining highly needed ones. The basic acts numbered 1 and 2 and tentatively, all minor acts in form (10) could be accordingly ignored here.

Regardless of the nature of the predetermined time for training, the designer, when distributing the available period on professional acts, may consider the following steps :

1. Transforming the available time of days/ hours into minutes, if the designer has for example one day training with seven hours only, then he will have the total of 420 minutes.
2. Adding up the criterion periods (in denominators) of the acts in column (7). If the ten basic acts (3-12) are taken for example, then the sum of their periods in minutes are 560.
   Whenever criterion periods are not available, the designer will add up instead, the percentage points in column (6) . The result in our case (f orm 10) is 117.
3. Finding the percentage of the criterion time for each act; by dividing its specified period on the grand total of all acts. (e.g. 40/560=.07).
   Once again if the criterion time is unknown, then the designer will use the percentage points dividing them by the grand total of 117 in form (10). The result will be training percentage points which each act deserves comparable to others within program (e.g 9/117 = .08 rounded).
4. Multiplying the criterion time percentage or the percentage point of each act in step 3 above, by the actual time available for training.

The result will be the observed training period of each act according to its weight within the program (e.g. .07 x 420 = 29.4 mns. or .08 x 420 = 33.6ms)

Considering the above steps, the training periods in minutes (using criterion time) for the acts (3-12) in form (10), are : 30, 30, 22. 5, 15, 45, 30, 90, 90, 22. 5, and 45.

When considering however, the percentage points, the training periods for the same acts (3-12) are: 43, 43, 57.4, 32.3, 57. 4, 21.5, 57.4, 57.4, 21.5, 28.7.

A difference is noted among time values specified by the two methods: the use of criterion time and percentage points of observed needs. This is due to the application of the criterion time which is more representative of acts' realities as first hand raw data than the percentage values as derived data (in colums 6).

Assessment of Sub-behaviors Within Job Acts and Their Parallel Training Periods Within a Program

The designer in this stage of training design, takes from form (10) the reported acts and their individual time periods, plotting them in form (11). He then reviews the nature of each act, breaking it down into five behavioral categories stated on the form.

In doing so , the designer relies on his professional expertise in the areas of training, curriculum making, behavioral psychology, educational evaluation, the designing science and elementary statistics.

The designer estimates the degrees of sub-behaviors embedded within each act by putting (√) in the appropriate space in form (11). He sums up the appraised degrees of sub-behaviors within each act (Column 8), then divide its training period by total degrees of sub-behaviors (note 3) .

The time value of the point is multiplied by the total points specified for each sub-behavioral category. The products are plotted in their places in the form (Column 3, 4, 5, 6 & 7).

The digital time values which are obtained above, will benefit the training design with the following:

1. Building the behavioral objectives of training, qualitatively and quan-

Form (11): Assessment of training percentages of acts and their parallel amounts of time within program.

The Job: Car driving ..... Designer: .....

The task: Car maintenance ..... Administration: .....

No.s	Professional acts (1) (illustrative examp.-s)	Knowledge				Application				Attitudes				Problem solving				Evaluation				(2) Sum of degrees	Notes
		L (1)	M (2)	H (3)	V. H (4)	L (1)	M (2)	H (3)	V. H (4)	L (1)	M (2)	H (3)	V. H (4)	L (1)	M (2)	H (3)	V. H (4)	L (1)	M (2)	H (3)	V. H (4)		
1	Maintaining battery water to required level	5							7.5	10	2.5											12	(1) Acts (3-12) in form (10).
2	Maintaining radiator water to required level	5							7.5		5						7.5			5		12	
3	Maintaining engine oil to required level		6						6			6					6				6	15	(2) Degrees are based on Low (1) moderate (2) High (3), and very high (4) ratings.
4	Maintaining wheel oil to required level		2						3			2					2			2		11	
5	Controlling engine temperature to required level			12					12			8					16			12		15	
6	Keeping car lights working properly.		3					3				3				3				3		10	(3) From numerators of form (10) column (7).
7	Keeping car brakes working effectively.				24				24				24			24					24	20	
8	Maintaining cleanliness of car			24					32			24			24					16		15	(4) Total time available for training on the ten acts is 457 ms. (refer to form (10). (5) Total behavioral degrees possible for training on objectives of program. (6) Total training time for acts (3-12) in column (7) of form (10).
9	Changing flat car tire.		2						3			2					3			1		11	
10	Keeping car locks working properly.			6					6				8				4					15	
	Sub-totals		17	48	24			3	32.5	66	2.5	20	30	32		9	48	40	1	31	24	24	136(5)
	grand totals		89				106.5				84.5				97				80				457 ms.

Behavioral Analyses of acts (4):

(1) Knowledge : $\frac{89}{457}$ = 19.5%

(2) Application : $\frac{106.5}{457}$ = 23.3%

(3) Attitudes : $\frac{84.5}{457}$ = 18.5%

(4) Problem Solving : $\frac{97}{457}$ = 21.2 %

(5) Evaluation : $\frac{80}{457}$ = 17.5%

The time value of a sub-behavioral degree within an act is :Period of act / sum of its degrees.

(1) $\frac{30}{12}$ = 2.5 ms.

(2) $\frac{30}{12}$ = 2.5 ms.

(3) $\frac{30}{15}$ = 2 ms.

(4) $\frac{11}{11}$ = 1 ms.

(5) $\frac{60}{15}$ = 4 ms.

(6) $\frac{15}{10}$ = 1.5 ms.

(7) $\frac{120}{20}$ = 6 ms.

(8) $\frac{120}{15}$ = 8 ms.

(9) $\frac{11}{11}$ = 1 ms.

(10) $\frac{30}{15}$ = 2 ms.

titatively according to ratios specified for the sub- categories of job acts.

The prospective training program will contain, for example, around 19.5% of its objectives specialized in knowledge, 23.3% in application, 18.5% in attitudes, 21.2% in problem solving, and 17.5% in evaluation and correction.

With form (11), the designer can maintain a high degree of precision in specifying and constructing the objectives of training. If one assumes, for example, that each degree within a sub-category embodies one behavioral objective, then there will be 12 formative objectives for act (I) in form (11), distributed as follows:

* Two objectives for knowledge .
* Four objectives for application .
* One objective for attitudes .
* Three objectives for problem solving .
* Two objectives for evaluation and correction .

2. Building the total program of training based on the behavioral objectives and digital ratios of behavioral categories of acts. Data of later forms (12-27), are generally built on the information of current one(11).

What Comes Next ?

The current chapter has anchored the behavioral digital bases of the proposed designing approach for training.

The chapter explains briefly the mechanisms of unifying professional needs, finding the training weights of job acts within program, specifying the performance field time of acts and the derivation of training time appropriate for their skills' development.

The next logical task will be to initiate the actual design of training. The first step of such an undertaking is designing the training curriculum with its elements: the goals, the knowledge content and achievement activities*. Chapter V is concerned with this significant step.

* Refer to chapter V for a definition of this term.

Part II : Designing The Training Program

5. **The Design of Training Curriculum: Goals, Knowledge and Achievement Activities.**

6. **Designing the Instruction of Training: Methods, Media and Technology.**

7. **Selection and Description of Human and Material Services.**

Chapter V

The Design of Training Curriculum: The Goals, Knowledge and Achievement Activities

Introduction

The training curriculum is the total professional knowledge and skills that trainees will achieve through participation in related learning and evaluation activities. Traditionally, the training curriculum embodies four basic elements: goals, knowledge content, learning activities and evaluation of achievement.

Learning activities are educational endeavors for achieving the mandated concepts, attitudes and skills. Evaluation procedures and activities as well are educational endeavors for determining the adequacy of learning achievements. Therefore, the two curricular elements could be lumped together in one item, that is, achievement activities or experiences. Hence, the traditional four components of the curriculum could be reduced in training to the above three only .

Further, while it is suggested that a training curriculum encompasses three major elements, the training program on the other hand extends beyond these three to all human, educational and material services which are deemed necessary for learning, teaching and implementing required training acts. Thus, the contents of chapters (5-9) comprise the concept of a training program. This chapter, nonetheless, limits itself to the curriculum of training, leaving the additional elements of the program to subsequent chapters.

The Design of Training Goals

Training goals, should be congruent with the philosophical implications of society. They must stem directly from the professional needs of the working force and institutions.

In subsequent paragraphs, the concept and types of goals are briefly prescribed, followed by some criteria for writing goals' statements. Lastly, the actual designing of goals themselves is presented.

The Concept and Types of Training Goals

Training goals are statements of professional intents, knowledge, attitudes or skills trainees will attain as a result of their participation in a training program. Goals statements, in order to be operational, should be linguistically sound, concise, clear and self-expressive on their contents.

Training goals, when stated broadly, and representing several behaviors/ knowledege and/ or attitudes, are known to be general or generic. When goals however are reduced in size to a specific or limited educational content, embodying thus particular skill, knowledge or value, they are called behavioral or specific objectives.

Considering the training stage in which goals are to be used, three new types will emerge: general goals or objectives which serve as a prelude or passing gates to program implementation; the formative objectives which are in reality the operating activities of training; and lastly, the terminal objectives which function mainly as guiding tools for implementation and as adequacy indicators for achievement evaluation.

The third classification of training goals is qualitative in nature, based on the behavioral domains. Goals in this regard could be cognitive, affective or psychomotor. The author of this book prefers, however, to adopt the following types of goals in training:

1. Professional goals/ objectives which focus primarily on job performance and responsibilities.
2. Organization's goals/ objectives which are concerned with administrative-supervisory matters of human and material services of work.
3. Personal goals/ objectives which concentrate on special needs of employees mostly outside work. These needs may be human, psycho-behavioral, family, economic, personal status, private concerns or merely personal ambitions.
4. Social goals/ objectives which are concerned basically with : human communication/ relations among different individuals and groups within an organization, social values, expectations, general codes and conducts that should be maintained throughout daily work/ life.

Criteria for Writing Training Goals

Goals, in order to be trainable, should be written according to specific criteria such as (goal statements in forms 12 and 13 which embody these criteria):

1. Valid representation of training needs. This is the most fundamental and crucial criterion which the designer must attend to, since content validity of goal statements will determine the validity of all training factors, processes and services.. starting from curriculum document, instruction of training, human and material services, to evaluation of productivity.
2. Sound language and meaning. Goal statements must be gramatically correct and self-expressive on their intents. They should be directly understood by all concerned parties without further need for clarification or interpretation. Otherwise, the statements should undergo some reshufflings or revisions to achieve current criterion.
3. Operational language. Neutral or vague verbs, for instance, should be avoided when building statements of goals, since these verbs may confuse training processes, particularly formative and summative evaluations. To know, comprehend, and apply are examples of neutral behaviors. Instead the verbs: to count, point, compute, summarize, detail, explain, perform, and execute are examples of operational verbs.
4. Complete/ meaningful structure. Statements of general goals should be fully spelled out. Statements of terminal and formative objectives on the other hand, must contain three components: The name of the required behavior or skill, its professional content, and criteria/ conditions of performance/ achievement.

Corresponding Relationships Among Training Goals and Job Content

It is obvious in education that goals, in order to be valid, must represent the required knowledge, behavioral or attitudinal content. In training, the representational and operational relationships among elements of training goals and professional content of a job, could be depicted as in the next diagram :

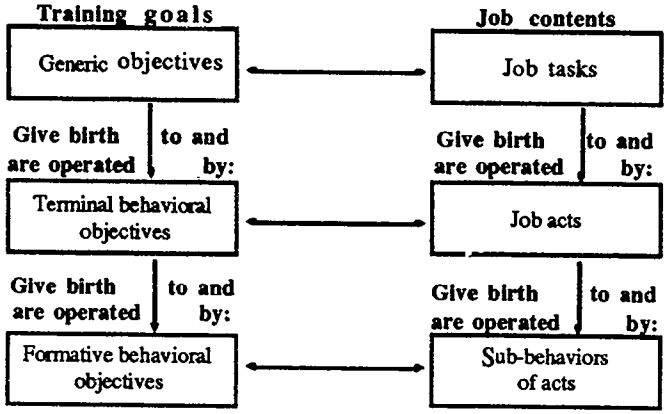


Figure I : Possible representational and operational relationships among elements of training goals and job contents.

The Design of Generic Goals and Terminal Objectives

Generic objectives or goals, as indicated earlier, are overall statements which encompass the training knowledge, attitudes and skills that a prospective program will foster in the reports of employees.

They are general in language and meaning to the extent that their achievement by trainees can not be directly measured. Consequently, the designer most likely will resort to more specific statements called behavioral objectives.

Behavioral objectives are professional statements derived usually from general goals; thus representing in explicit terms, the skills to be attained as a result of training.

Two main types of behavioral objectives prevail in education and training: terminal and formative. Terminal objectives in this paragraph are statements of summative or final abilities which will be produced by training.

Formative objectives in the next paragraph, are micro-steps or sub-behaviors that, when performed sequentially, will lead to the formation of final abilities embedded in terminal objectives.

Form (12) specializes in the development of general and terminal objectives. The designer could use the form as follows:

1. Constructing general goals after the names of job tasks.

If the task is behaviorally simple in composition, then one general

Form (12): Design of generic & terminal objectives of training.

The job: Car driving Designer: .....

Task: Car maintenance Administration: .....

No.s	Job acts (Illustrative examples)	General goals	Behavioral terminal objectives (Illustrative examples)
1	Maintaining battery water to required level.	Given all the tools, equipment, and materials used normally in car maintenance, the trainees will successfully perform the ten major skills required in the program.	1. The trainee will maintain battery water of his car at all times with precision of 100%.
2	Maintaining radiator water to required level.		3. The trainee will check the adequacy of engine oil against required level with precision of 100% during 3 mts.
3	Maintaining engine oil to required level.		5. The trainee will be able to control engine temperature at all times by using different means learned in the training program.
4	Maintaining wheel oil to required level.		7. The trainee will maintain car brakes effectively working by applying all means available to him.
5	Controling engine temperature to required level.		8.1. The trainee will park his car and display caution signs during 3 mts, with success of 100%.
6	Keeping car lights working properly.		8.2. The trainee will prepare all tools necessary for changing the tire with success of 100% during 2 mts.
7	Keeping car brakes working effectively.		8.3. The trainee will lift the car by jack with 100% precision.
8	Changing flat car tire.		8.4. The trainee will take off the flat tire and store it in trunk in 3 mts.
9	Keeping car locks working properly.		8.5. The trainee will place the good tire in its position and tighten all screws with precision of 100% in 3 mts.
10	Maintaining cleanliness of car.		8.6. The trainee will lower jack & store all tools in their place within trunk in 2 mts.

goal will be adequate.The example in form (12) conforms with this case. When the task however is compound, several goals become necessary. The designer makes sure, in this respect, to develop a goal for each behavioral block within a job the task. Reviewing the task's content (or acts) coupled with its title will enable him to build required general goals for training.

For illustration, the task (observance of traffic safety and laws within a job: car driving) is taken as an example. Two major components arise in this task: laws of driving on the road, and laws of human and material safety. As a result, two general goals become mandatory, each concentrates on a different behavioral block already stated.

2. Modeling terminal objectives immediately after a job's acts. As form (12) shows, the behavioral objectives are almost mere restatements of their parallel acts.

Once again, if the act has a relatively limited content, and could be performed by employees within a reasonably short period of time, then one objective will suffice. If the act, on the other hand, is complex, then more objectives will be needed, depending on the degree of behavioral multiplicity of the act itself.

The Design of Formative Objectives

Formative objectives are professional statements representing the micro-steps or sub-behaviors of acts or terminal objectives. When these objectives are executed sequentially, it will lead to the formation of final abilities required by training. Form (13) concerns itself with the design of current objectives.

When deriving formative objectives, the designer looks either at job acts or terminal objectives. If the sub-behaviors of acts, are already specified, then the designer could list them as they are, or with minors linguisticl modifications.

Whatever the developmental procedure the designer may pursue, the following conditions should be met in stating formative objectives:

1. Linguistically sound and clear.
2. Behaviorally sequenced.
3. Behaviorally observable.
4. Behaviorally measurable.
5. Behaviorally operational.

Form (13): Design of formative objectives of training.

The job: Car driving Designer: .....

Task: Car maintenance Administration: .....

General goals	Terminal behavioral objectives	Formative behavioral objectives
Given all the tools, equipment, and materials used normally in car maintenance, the trainees will successfully perform the ten major skills required in the program.	1. The trainee will maintain battery water of his car at all times with mastery level of 100%.	1.1. Will bring battery water from car's trunk within one minute. 1.2. Will lift engine cover and secure it within one minute. 1.3. Will clean dust and other matters from battery within 2 minutes. 1.4. Will unscrew battery knobs and put each beside its pocket within 2 minutes. 1.5. Will fill battery pockets with water as needed within 3 minutes. 1.6. Will check the adequacy of battery water with accuracy of 100%. 1.7. Will close battery pockets by screwing knobs within 2 minutes and accuracy of 100%. 1.8. Will take down engine cover, returning it to its position with accuracy of 100%. 1.9. Will store water can in its place within car trunk.
	3. The trainee will check the adequacy of engine oil against required level with precision of 100% during 3 minutes.	3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8

Formative objectives specified in this stage of training design, maintain a major role in next forms (14, 15, 16, 17, and 18); since the designer upon them will derive training knowledge, achievement activities, methods and media in the following paragraphs and chapters.

The Design of Training Knowledge

Training knowledge is the sum of terms, facts, concepts, principles, rules, steps, criteria or anything else which represents the academic content of terminal or formative objectives or their counterparts in the job acts. These types of professional knowledge should be learned by the trainees as a part of achieving the behavioral skills required by a training program.

Criteria for Selecting and Organizing Training Knowledge

Training knowledge could be selected and organized according to criteria such as:

1. Selecting knowledge after the content of terminal or formative objectives or job acts. Working with this criterion will provide training curriculum with the needed valid knowledge.
2. Selecting knowledge according to its importance in attaining professional objectives or acts. Professional knowledge in this regard may be classified into three categories:
   * Basic knowledge which represents a must for trainees to achieve. This knowledge directly embraces the content of terminal or formative objectives.
   * Worthy knowledge which completes vertically and horizontally the learning of basic knowledge.
   * Minor knowledge which enriches, deepens or enlarges the achievement of basic and worthy knowledge.

If types of water that are used or dinarily with car battery denote for example, a basic knowledge (like those of known commercial products), and others which may substitute basic water (such as desalinated water) are seen to be worthy knowledge, then types of water or liquids which could possibly be used in emergencies where basic and worthy waters are totally out of hand, signify minor knowledge.

Form (14): Selection and description of training knowledge.

The job: Car driving Designer: _____

Task: Car maintenance Administration: .....

The act: Reserving battery water Date: _____

No.S	Formative objectives (Illustrative examples)	Training knowledge* (Illustrative examples)
1-1	Will bring battery water from car's trunk within one minute.	Types of battery water; types and functions of car battery.
1-2	Will lift engine cover and secure it in one minute.	Concept of engine cover, the securing tool; steps of lifting the cover.
1-3	Will clean dust and other matter from battery within 2 minutes.	Concept of battery cleanliness; its benefits; materials and tools used; steps & criteria of cleanliness.
1-4	Will unscrew battery knobs and put each beside its pocket within 2 minutes.	Battery pockets; their parts and functions.
1-5	Will fill battery pockets with water as needed within 3 minutes.	Steps of filling pockets with water.
1-6	Will check the adequacy of battery water with accuracy of 100%.	Criteria of water adequacy in battery pockets.
1-7	Will close battery pockets by screwing knobs within 2 minutes and accuracy of 100%.	Closing steps of battery pockets; criteria of effective closing.
1-8	Will take down engine cover, returning it to its position with accuracy of 100%.	Steps of closing the engine cover; criteria of effective closing.
1-9	Will store water can in its place within car trunk.	Concept of storing, places appropriate for storage; criteria of effective storage.

* In the actual designing of the training program, knowledge should be spelled out to its necessary / finest details.

3. Organizing knowledge according to sequence of job acts or terminal objectives and their offspring, the formative ones. Training knowledge is arranged here after the curricular/ practical sequence of above professional tools.

Selection and Description of Training Knowledge

Considering the criteria stated in the previous paragraph, the designer could derive training knowledge by simply writing formative objectives in form (14), specifying for each the knowledge headlines of its behavioral content.

The designer may, afterwards, detail the training knowledge to the degree which is deeemed necessary for professional/ academic understanding by both trainees and trainers. Specialized job sources should be consulted of course, in order to obtain the appropriate knowledge in this regard.

The designer, however, can derive training knowledge directly from the less specific terminal objectives or their predecessors: the job acts. The main shortcoming which probably accrue out of this process is the failure to recognize some types of knowledge that are basic to the comprehension of required training skills:

The Design of Achievement Activities

Achievement activities are all learning and formative evaluation activities which trainees encounter throughout the course of their training. These activities play two fundamental educational roles: the comprehension of professional experiences which program's objectives and knowledges call for, and determining the adequacy of this comprehension.

While achievement activities serve as a vehicle for translating program's objectives and knowledges into behavioral skills, they represent the third major element of training curriculum.

Criteria for Selection and Construction of Achievement Activities.

In principle, andragogy is different from pedagogy. Therefore trainees, as adults, require somewhat diffrent achievement activities than those of young learners. Consequently, several criteria should be noted when these activities are selected and constructed for training.

1. The educational, behavioral and content implications of formative objectives or the sub-behaviors of job acts.
   If the objective calls, for example, for definition of terms, recalling facts, concepts, principles or steps; explanation of a factor or process; performance of a skill, then achievement activities should adopt these educational abilities.
   Further, if the behavioral nature of an objective is an oral, written or psychomotor one, learning and evaluative activities should therefore conform with whatever the behavioral nature might be.
   Moreover, the training activities for learning and evaluation, in order to be professionally valid, must fully represent the curricular contents of formative objectivies from which achievement activities are originally derived.
   In summary, learning-evaluative activities should be modeled first and foremost after the act's behaviors or formative objectives of training, in terms of:
   * Educational ability.
   * Behavioral nature.
   * Professional content.
2. The homogeniety versus the heterogeniety of trainees backgrounds.
   In this regard, different professional backgrounds of trainees require dissimilar achievement activities, different exercises, examples, projects, learning evaluative tools, procedures and behavioral situations.
   The author of this book, as a trainer during 1988/1989, experienced the reality of the above statement. Various geographical, professional and educational/academic backgrounds of trainees who participated in three training programs necessitated the use of different activities for both learning and evaluation (Refer to chapter I for their countries, professional affiliations and the professions involved).
3. Length of time available for training. The more time that there is available for training, the more training activities may be employed in learning and evaluation. On the other hand, a shortage of time forces staff personnel to limit themselves to a minimum that barely permits the achievement of trainees' needs.

4. The budget available for training. Unrestricted or open budget gives the designer and training personnel free hands to select/construct any type of activity believed to foster the achievement of trainees. This kind of budget is far more productive in training than its counterpart: the restricted one, or the other which undergoes financial cuts due to economic deprivations or uncertainties.
5. The nature of human and material services available for training. The availability of qualified and sufficient trainers, experts, administrators, technicians, secretarial, and maintenance personnel and facilities, equipment, machinery, media, materials and technology ... will make it possible for the designer to differentiate training activities as much as needed. While limited human and material resources will limit activities to a large degree, affecting negatively the achievement of professional skills.

There are, of course, additional criteria which could also be considered and are widely cited in training literature[1] such as: the congruence of achievement activities with adults characteristics, experiences, desires, difficulties, aptitudes, needs for experimentation and feedback.

While the above extra criteria are important for maintaining the quality and validity of training activities, they could be fulfilled automaticaly through the application of the main five, previously cited.

The Design of Achievement Activities: The Learning Component.

Learning activities are what trainees say, listen, write or do to transform the objectives and knowledge contents of training into required professional skills.

Form (15) represents a simple tool for designing learning activities. It is composed of two main categories: the first is devoted for formative objectives (or job acts), while the second is for listing learning activities appropriate for each objective or act.

When writing learning activities, the designer may consider the following:

1. Constructing multi-level inductive activities for each objective. To ease this task for the designer, he may adopt one or more of the following behavioral taxonomies: Bloom's taxonomy of cognitive domain; Krathwohl's taxonomy of affective domain; Harrow's taxonomy of psychomotor domain or Derr's taxonomy of social purposes.

If, for example, the formative objective belongs to the application level of the cognitive domain (e.g objective 1 - 1), then knowledge, comprehension and application exercises may deem subsequently necessary to produce the final required skill.

With the same token, if the objective represents an evaluative skill (e.g. objective 1 - 6), then knowledge, comprehension, application, analysis, synthesis and evaluation activities would seem appropriate for the achievement of the above objective.

Two things should be noted, nonetheless, when using learning activities which belong to lower behavioral levels of the required professional skills due to different human, financial, material and time constrains usually imposed on training:

* Should be adopted only in training whenever the designer/ trainer doubts the capability of trainees to achieve, normally, the mandated skills, due to some inadequacies in their knowledge and experience backgrounds.
* Should be brief, direct and most relevant.

2. Constructing learning activities that are representative of each behavioral skills embedded in formative objectives.. whether this representation is of the behavioral type, nature, or fidelity.

   One simple way to achieve this skill validity, is to look at the objective, recognizing its behavior and performance conditions, then developing the activities that are operational in translating the theoritical statements of professional goals and facts into concrete observable skills.
3. Constructing extra activities whenever possible, for the purpose of skill concentration or over-achievement. The successful training program is one which provides trainees with opportunities to transform initially developed skills into daily working habits.

Form (15) : Design of learning activities of training.
The Job : Car driving Designer: .....
The task : Car maintenance Administration: .....

No.S	Formative objectives (Illustrative examples)	Learning activities (Illustrative examples)
1-1	Will bring battery water from car's trunk within one minute.	Trainee defines battery water, recalls different brands/types of battery water; prepares water for battery use.
1-2	Will lift engine cover and secure it with the special tool within one minute.	Trainee defines engine cover; names the lifting steps of engine cover; performs the steps sequentially.
1-3	Will clean dust and other matters from battery within 2 minutes.	Trainee defines battery cleanliness; recalls things to be cleaned from battery; names tools and materials used in battery cleaning; cleans three different kinds of car battery.
1-4	Will unscrew battery knobs and put each beside its pocket within 2 minutes.	Trainee defines battery knobs and pockets; explains battery parts and functions; performs the opening of battery pockets.
1-5	Will fill battery pockets with water as needed within 3 minutes.	Trainee specifies battery pockets that need water; fills pockets with water as needed.
1-6	Will check the adequacy of battery water with accuracy of 100%.	Trainee mentions adequacy criteria of battery water, evaluates the adequacy of battery water according to specified criteria.
1-7	Will close battery pockets by screwing knobs within 2 minutes and accuracy of 100%.	Trainee names steps of closing battery pockets, criteria of effective closing; closes battery pockets effectively.
1-8	Will take down engine cover, returning it to its position with accuracy of 100%.	Trainee recalls closing steps of engine cover; counts criteria of effective closing. closes engine cover effectively.
1-9	Will store water can in its place within car trunk.	Trainee defines concept of storing, specifies appropriate places and criteria of storing, stores battery water within trunk.

Form (16) : Design of formative evaluation of training
The Job : Car driving Designer: .....
The task : Car maintenance Administration: .....

No.S	Formative objectives (Illustrative examples)	Formative evaluation (illustrative examples)
1-1	Will bring battery water from car's trunk within one minute.	Trainee answers appropriate oral / written tests; brings water bottle within one minute, from car trunk whenever is asked to do so.
1-2	Will lift engine cover and secure it with the special tool within one minute.	Trainee answers appropriate oral / written tests; lifts engine cover successfully within one minute.
1-3	Will clean dust and other matters from battery within 2 minutes.	Trainee answers oral / writen questions; cleans dusty battery within two minutes with 90% success.
1-4	Will unscrew battery knobs and putting each beside its pocket within 2 minutes.	Trainee answers appropriate oral/ written questions; opens battery knobs successfully within two minutes.
1-5	Will fill battery pockets with water as needed within 3 minutes.	Trainee fills battery bockets with water as needed within three minutes.
1-6	Will check the adequacy of battery water with accuracy of 100%.	Trainee answers appropriate oral/ written test; evaluates the adequacy of water in battery with accuracy of 100%.
1-7	Will close battery pockets by screwing knobs within 2 minutes and accuracy of 100%.	Trainee answers oral / written questions; closes battery pockets in two minutes and with 100% percision.
1-8	Will take down engine cover, returning it to its position with accuracy of 100%.	Trainee answers appropriate oral/ written questions; closes engine cover with 100% accuracy.
1-9	Will store water can in its place within car trunk.	Trainee answers oral/written questions; stores water bottle successfully in car trunk within one minute.

The Design of Achievement Activities: The Formative Evaluation Component

Formative evaluation occurs during training and concerns itself with the augmentation of learning by guiding, improving and building the achievement of required professional skills.

The tools of formative evaluation are usually a mixture of personal interviews, work projects, individual and group exercises, oral, written and performance exams.

When designing formative evaluation, the designer may examine the formative objectives in form (16), one after another, subsquently writing for each, the evaluative experiences that trainees should encounter in order to improve the quality of learning, thus complying witn the achievement standards adopted by the training program.

What Comes Next ?

The above chapter has explained the design concepts and mechanisms of a training curriculum, with its major elements: the goals, knowledge content and achievement activities.

The logical step that follows now, is the selection and description of methods, media and technology which will carry out the activities and responsibilities of the training curriculm to their ultimate ends: the development of professional skills by trainees. Chapter VI treats these instructional topics.

Chapter VI

Designing the Instruction of Training: Methods, Media & Technologies

Introduction

The instruction of training is primarily accomplished by the use of appropriate methods, media and technologie.
These instructional mechanisms represent the communication vehicles for the messages of training. This mediating role of training messages by instruction, could be depicted in figure (I).

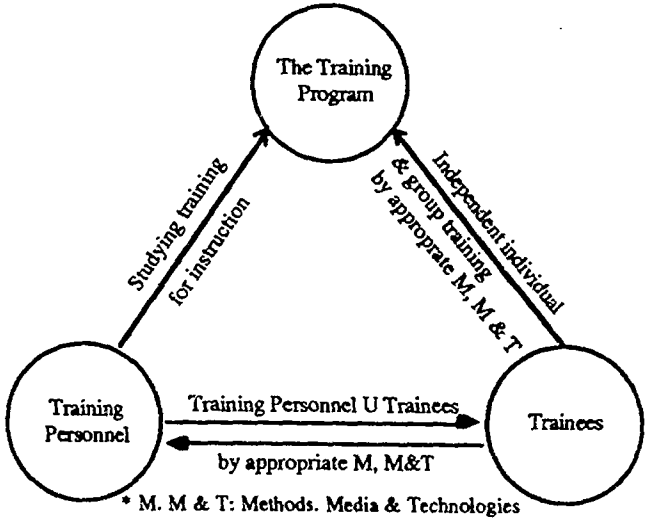


Figure I: The role of methods, media and technology in the instruction of training.

The following paragraph will present the concepts and types of basic methods, media and technologie used in training, followed by the criteria and devices of their selection and description for training.

Concepts and Types of Training Methods

Training methods are communication tools between trainers and trainees. They are also the carriers of information and professional content during the course of instruction. Generally, training methods may be classified within the following categories:

Training Methods According to Presentation Form:

1. Vocal, e.g. questioning and lecturing.
2. Written, e.g. exercises, reports, programmed training and individual prescriptions.
3. Practical, e.g. performance exercises, demonstrations, apprenticeships and on-job training.

Training Methods According to Roles in Training:

1. Planning, e.g. the Delphi technique, job accidents, case study, basket decisions, and simulation materials, games and exercises.
2. Developmental, e.g. lecturing, on-job training, programmed training, apprenticeship, micro-training, laboratory training, and behavioral modification techniques.
3. Evaluative, e.g. role playing, training by objectives, questions and answers, projects, and application exercises.

Training Methods According to Number of Trainees:

1. Individual, e.g. computer-assisted training, individual prescription, programmed training, personal or private tutoring, and individual projects.
2. Small groups, e.g. group exercises, group discussions, micro training and role-playing.
3. Large groups, e.g. lecturing, open (auditorium) demonstration, open questions.

Training Methods According to Behavioral Domain:

1. Knowledge development, e.g. lecturing, questionning, programmed training, and computer-assisted training.
2. Skill development, e.g. on-job training, apprenticeship, demonstration, simulation exercises, micro training, and performance exercises.

3. Problem solving, e.g. job accidents, case study, basket decisions, training by objectives, the Delphi technique, and projects.
4. Attitude development, e.g. group discussion, role playing, modeling , behavioral modification, and field visitation.

Training Methods According to Location:

1. Inside the training institution (on-campus methods), e.g. laboratory training, micro-training, basket decisions, simulation games and exercises, computer-assisted training, questioning and lecturing.
2. Outside the training institution (off-campus methods), e.g. field visitation, the Delphi technique, on-job training, apprenticeship, case study, and field projects.

Training Methods According to Human Performers:

1. Trainer's methods, e.g. lecturing, questionning, modeling, behavioral modification, training by objectives.
2. Trainees' individual and group methods, e.g. independent training, programmed training, individual/ group projects, private training, training by prescriptions, case studies, basket decisions, group demonstrations, role playing, micro training.
3. Expert methods. Experts could be local or international, part-time and outside trainers. Examples of their methods are: apprenticeship, on-job training, field visitation, guided off-campus projects, the Delphi technique, demonstration of selected skills, lecturing on special topics.

Selection Criteria of Training Methods

Several criteria determine the nature of selected methods for training. These are :

1. The number of trainees participating in the program. It is suggested here that if the program has 1-5 trainees, then individual methods could be adopted. On the other hand, a mixture of individual and group methods are to be used when trainees are between 6-25. Finally, large group methods become possible when trainees exceed 26 in number.
2. Trainees' personal characteristics and professional backgrounds, their age categories, and social status.

3. Trainers qualifications to implement training. Highly qualified personnel make differentiation of methods possible.
4. The nature of training tasks. The tasks could be theoretical, practical, attitudinal, human relations in nature, or, could be knowledge, application, problem solving, attitudinal, and evaluation and guidance. These different tasks demand the use of different methods.
5. The amount of time available for training. More time permits different methods to be used.
6. The availability of human and material services (including the financial budget). These services beside trainers, are the most crucial factors which limit or enrich the use of training methods.
7. The responsive ability of methods to training needs which could be:
   A - Motivation B - Active participation C - Individulization D - Content sequencing E- Feedback F- Learning transfer.
   Different methods do fulfill, of course, different training needs. A sample in this regard is summarized in the following list (1) :
   * Lecturing : D.
   * Group discussion : A, B, C, and E.
   * Case study : A, B, C, D, E, and F
   * Simulation experiences : A, B, C, D, E, and F.
   * Role playing : A, B, C, D, E, and F.
   * Working projects : A, B, C, D, E, and F.
   * On-job training : A, B, C, D, E, and F.
   * Assignments: B, C, and D.

A Sample of Methods Used in Training

Many methods are currently used in training, among the most common, are the listed below:

1. Lecturing/ oral illustration.
2. Questioning.
3. Training by objectives.
4. Competency-based training.
5. Computer-assisted training.
6. Performance exercises.
7. Small group discussions.
15. Delphi technique .
8. Small group practices.
9. Tutoring or private training.
10. Modeling.
11. Individual prescription.
12. Case study.
13. Basket decisions.
14. Job accidents.

16. Work projects/ reports .
17. On-Job training .
18. Apprenticeship .
19. Micro-training .
20. Behavioral modification .
21. Demonstration .
22. Role playing .
23. Simulation exercises.
24. Programmed training
25. Expert training .
26. Laboratory training .
27. Independent training .
28. Field visitation .
29. Training packages .
30. Training kits .

Selection and Description of Methods for Training

When selecting methods for training, the designer resorts to the use of the criteria in the previous paragraph. To ease this job for the designer however, form (17) is presented.

Form (17) is composed mainly of two categories; one for formative objectives and the other for parallel training methods. Formative objectives nonetheless, could be substituted by job acts or terminal objectives, if these are more available or deemed more operational in deriving the proper training methods.

Instructional disqualification of trainers may, however, force the designer to elaborate on form (17) by introducing explanatory notes for each selected method concerning the concept, situational use, and application steps.

While the designer could use form (17) for suggesting specific method (s) for each formative objective, the following sequence is proposed here:

A. The selection and use of three methods for the initial learning of professional skills: oral illustration or presentation, or short lecturing through which basic information/ knowledge is presented to trainees; behavioral demonstration; then question and answer method.
B. The selection and use of what is appropriate from remaining methods formerly cited. considering particularly the following important methods:

Form (17): Selection and description of methods of training.

The job: Car driving
The Task: Car maintenance
The act: Maintaining battery water

Designer: .....
Administration: .....
Date: .....

No.s	Formative objectives	Training Methods (Illustrative examples)
1.1	Will bring battery water from car's trunk within one minute.	Short lecturing, demonstration, group practice.
1.2	Will lift engine cover and secure it with the special tool within one minute.	Oral illustration, demonstration, question and answer, individual tutoring, small group exercises.
1.3	Will clean dust and other matters from battery within 2 minutes.	Oral illustration, demonstration, individual and group practices.
1.4	Will unscrew battery knobs and put each beside its pocket within 2 minutes.	Oral presentation, modeling, individual practice.
1.5	Will fill battery pockets with water as needed within 3 minutes.	Short lecturing, demonstration, simulation exercises, individual practices.
1.6	Will check the adequacy of battery water with accuracy of 100%.	Short lecturing, case studies, group practice.
1.7	Will close battery pockets by screwing knobs within 2 minutes and accuracy of 100%.	Oral illustration, demonstration, individual and group exercises.
1.8	Will take down engine cover, returning it to its position with 100% accuracy.	Oral illustration, modeling, individual practice.
1.9	Will store water can in its place within car trunk.	Short lecturing, demonstration, question and answer, individual practice.

1. Personal or individual tutoring or independent training.
2. Peer group tutoring (trainees tutor trainees).
3. Modeling.
4. Individual practice.
5. Small group exercises/ practice.
6. Small group discussions.
7. Individual prescription.
8. Basket decisions.
9. Case study.
10. Computer-assisted training.
11. Micro training.
12. Job accidents.
13. On-job training.
14. Apprenticeship.
15. Work projects.

The Concept and Types of Training Media and Technologies

Training media and technologie are information vehicles conveying required knowledge, skills and attitudes to :

1. Trainers who give them away by means of instruction.
2. Trainees who take them by means of learning.

Media and technologie could serve, by their own rights, as primary instructional/ learning techniques or devices; or as aides to instructional methods used in training. These educational tools may be grouped within the following categories:

1. Realia, e.g. experts, community sites, museums and exhibits.
2. Specimens and artifacts, e.g. models , simulation machines, materials and tools, and real samples .
3. Training laboratories, e.g. micro-training rooms, photography studios, media development centers, behavioral modification/ developemnt centers or clinics.
4. Photographs, illustrative drawings and maps.
5. Motion pictures including 16 mm and 8 mm films, videos and television.
6. Still projected visuals including slides, transparencies, opaque materials, film strips, micro-films, and fiches.
7. Audio materials including cassettes, cartridges, reels, hands free tele-phones, audio cards, closed circuit radios, audio slides.
8. Instructional boards and bulletins.
9. Printed materials, e.g. handouts, textbooks, work/ guide bocks, newspapers, magazines, programmed materials.

10. Training packages and kits.
11. Computers, software and electronic materials.
12. Tele-media (audio-visual and A/V).
13. Dramatics, role playing and games.

Selection Criteria of Media and Technologies for Training

Media and technologies may be selected for training by criteria such as[2] :

1. Technical characteristics, e.g. light, sound, and technical production.
2. Content representation of training.
3. Usability in training facilities.
4. Compatibility with trainees' cognitive styles.
5. Reasonable buying/maintenance costs.
6. Usability within training time.
7. Compatibility with professional qualifications of training personnel.

Selection and Description of Media / Technologies for Training

To select and describle appropriate media and technologies for training, the designer should have in hand both selection criteria, and adequate theoritical/ practical knowledge. The criteria stated formerly, will enable the designer to designate the right mediums for transmitting professional messages; while specialized knowledge will make it possible for him to differentiate among various types of available media and technologies, then manipulating their use to the degree constructive for training.

Form (18) is offered for initial selection and description of training media and technologies. It utilizes basically the formative objectives, though job acts and terminal objectives that may be employed instead.

When selecting and describing media and technologies for training, two principles should be noted:

1. Description of media and technologies on seperate sheets, when professional qualifications of training personnel, are in doubt.

2. The selection of one type of media and technology, if it proves effective for the instruction of training.

This proposition stems from the fact that training is a process composed primarily of direct technical acts, and bound strictly to specific period of time.

Motivational Principles of Professional Interaction in Training

Training, like any other topic of education, is a teaching process through which trainees interact with human and material services to achieve the mandated professional skills. Hence, in order to foster this interaction and make it consequently more productive, several motivtional principles should be maintained[3].

1. Pacing the information and activities of training to allow for trainees to comprehend the professional content.
2. Focusing on present and realities of trainees, by providing them with real experiences, problems, events and activities which are sampled directly from their professional/ work setting.
3. Providing trainees with adequate opportunities to express themselves, their professional needs, and individual life experiences.
4. Encouraging trainees to carry out the responsibility of their ideas and actions by means of illustrations, interpretation and justification.
5. Responding to desires of trainees concerning the types and timing of training activities.
6. Making sure that trainees understand at all times the mission of the training, e.g. goals, knowledge, skills, activities... etc.
7. Avoiding strict formalities in communicating/ interacting with trainees. Instead, humanilty, self-confidence and respect for fellow human kind are used to encourage trainees' involvement in the activities of training.
8. Utilizing previous knowledge and experiences of trainees in the conduct of training. Giving each trainee a specific, appropriate responsibility will enhance his contribution to the advancement of training.

Form (18): Selection and description of media and technologies for training.

The job: Car driving
The Task: Car maintenance
The act: Maintaining battery water

Designer: .....
Administration: .....
Date: .....

No.s	Formative objectives	Training Media and Technologies (Illustrative examples)
1.1	Will bring battery water from car's trunk within one minute.	Real battery water, role playing; videotape; audio slides; pictures of water branks; explanatory notes or handouts.
1.2	Will lift engine cover and secure it with the special tool within one minute.	Role playing, real car, car simulator, drawings & pictures, video, 8mm or 16 mm films, instructional boards, slides, overhead transparencies, programmed materials.
1.3	Will clean dust and other matters from battery within 2 minutes.	Real battery; cleaning materials and tools; dramatics; audio cassettes; video, 8mm and 16mm films; slides; pictures; programmed materials.
1.4	Will unscrew battery knobs and put each beside its pocket within 2 minutes.	Real battery; printed handouts; pictures.
1.5	Will fill battery pockets with water as needed within 3 minutes.	Real battery; battery water; role playing; slide presentation.
1.6	Will check the adequacy of battery water with accuracy of 100%.	Video 8mm, or 16mm films; illustrative drawings; handouts.
1.7	Will close battery pockets by screwing knobs within 2 minutes and accuracy of 100%.	Real battery; pictures; slides; drawings; handouts.
1.8	Will take down engine cover, returning it to its position with 100% accuracy.	Same as in (1-2) above.
1.9	Will store water can in its place within car trunk.	Same as in (1-1) above.

9. Interacting openly with trainees as mature individuals with different/ rich life and professional experiences at their disposal.
10. Avoiding any form of punishment during training, except those concerned with disciplinery and administrative matters such as absenteeism, misconduct or any others.
11. Adopting over-achievement techniques whenever possible to enable trainees to master required professional skills.
12. Pacing training activities over the available period to provide trainees with ample time to rationalize, participate and achieve required professional skills.
13. Encouraging cooperation instead of personal competition of trainees; and providing objective support and guidance instead of criticism and hunting for faults.
14. Providing systematic feedback to trainees concerning the qualities and degrees of their achievements, then guiding them to appropriate experiences for correction and enrichment.

Principles and Techniques of Organizing Trainees and Training Services

The overall organizational principles which should be maintained throughout training is the avoidance of lecturing as a method of instruction and as a coordinating mechanism of human and material services. This cautioning principle, stems from the fact that training is not, in its own right, an educational tool for the masses like lecturing is. Rather, it is mostly concerned with the behavioral education of individuals and small groups.

Considering the proposition above, principles and techniques for the organization of trainees and training services, are suggested below.

Organizational Principles of Trainees and Training Services

Five principles are offered to organize the intended environment for training. These are:

1. Manipulation of human and material services of training to allow for :

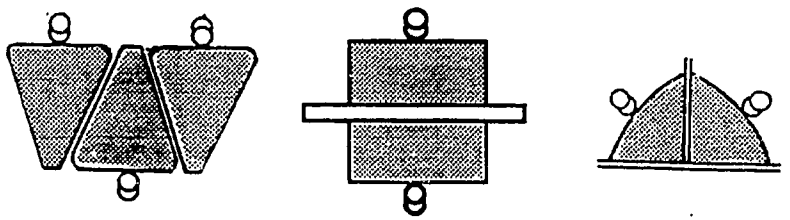
* Active practicing of professional skills
* Differentiation of individual and small groups activities and exercises.
* Repeating training for mastering the professional skills whenever necessary.
* Pacing training tasks according to emergent needs.

2. Effective utilization of available facilities, equipment, materials, machiney, media and technology.
3. Allowance for modeling and application exercises of training skills
4. Fostering active participation of trainees and human services in training.
5. Providing trainees with systematic feedback for correction, practice and follow-up activities.

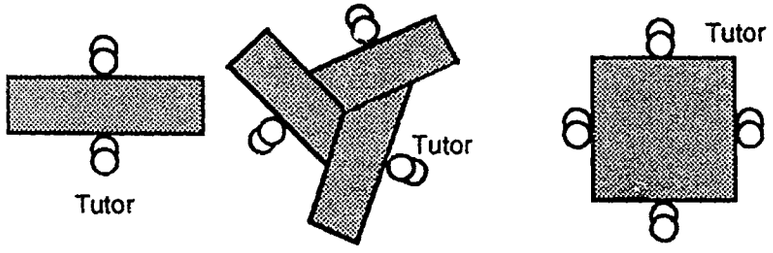
Organizational Techniques of Trainees and Training Services

The organizational techniques prevailing in training, are of individual and small groups in nature. These techniques are explained below:

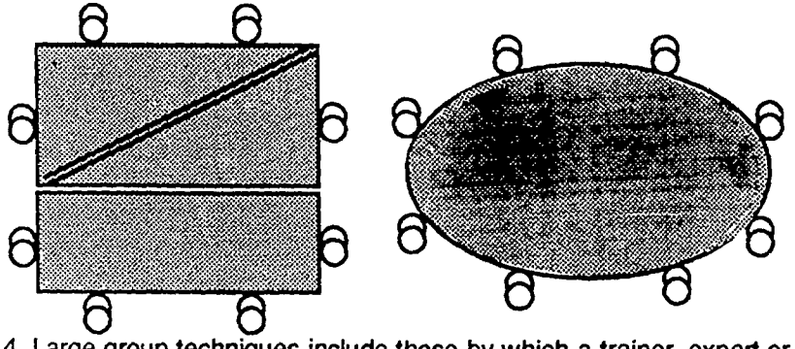
1. The individual / independent technique is one by which trainees train themselves, using working prescriptions, packages, kits, or special assignments. Suggested physical arrangements of this technique appear in the following illustrations .



2. Private tutoring techniques are those by which a trainer tutors one to three trainees, or a trainee works with one to three peers for the development of specific professional skills. Physical arrangments of this technique could be as illustrated below :

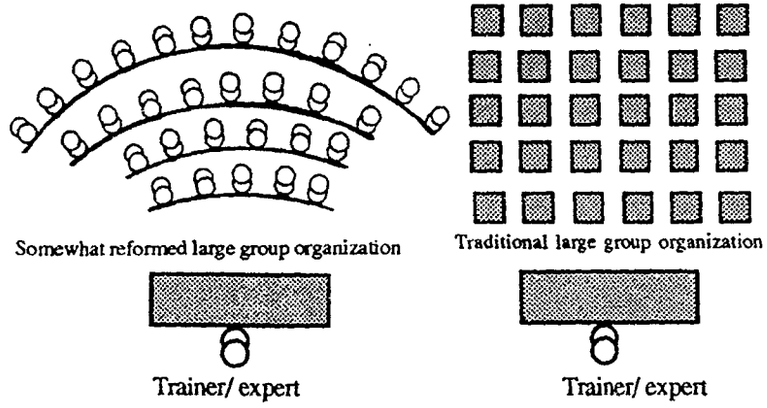


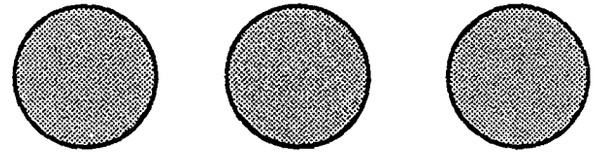
3. Small groups techniques are those by which a trainee leads a group of 5-12 peers to discuss a topic, model a skill, exercise a behavioral act or perform an assignment or project. The technique may use forms like these:



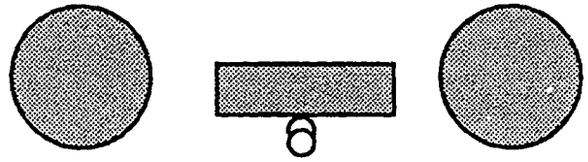
4. Large group techniques include those by which a trainer, expert or an administrator addresses a whole audience of trainees. Large groups may be used for the purposes of presenting new information, whether professional knowledge, patterns of daily conduct, administrative rules, instructions, human services or introductory announcements prior to the start of a training program.

While previous techniques are widely used in the instruction of training, the large group technique is limited to very few instances, among them the ones cited above. The organizational forms of large groups may appear as the following:





A reformed large group organization



General Framework for the Instruction of Training

This concluding paragraph presents a general instructional framework for training. The framework is explained briefly as follows(4) :

A. Planning training by considering:
   1. The behavioral objectives of training.
   2. The backgrounds of participant-trainees.
   3. The time available for training.
   4. The professional content of training.

5. The facilities, equipments, tools, machinery, materials, media and technologies which are available for training.

B. Preparation of training materials necessary for accomplishing the behavioral objectives, which are compatible at the same time with elements stated in paragraph (A) above.
Examples of these materials are: exercises, demonstrations, case studies, slides, transparencies, drawings, photographs, specimens, models, simulators, study questions, tests, work projects; handouts or summary notes and educational boards.

C. Preparation of training lessons by taking into account, elements of above paragraphs (A and B). The components of each lesson could be :
1. The serial number of the lesson and its working title.
2. The implementaion date of the lesson during the course of training.
3. The allocated time in hours or minutes.
4. The general goal of the lesson as well as its behavioral terminal objectives.
5. The knowledge, skills, or previous lessons which are prerequisites for the achievement of each lesson.
6. The knowledge content of behavioral objectives specified for each lesson.
7. Activities, exercises, projects and assignments which trainees will do while learning the lesson.
8. Procedures and activities of formative evaluation necessary for the achievement of the objectives of training.
9. The instructional tools of the lesson which are :
* Human training services.
* Appropriate methods.
* Training materials, media and technology.
* Training sites or facilities.
* Trainers working resources, if different from those designated for trainees.
* Final tests which should be administered at the end of each lesson.

D. Organization and preparation of training facilities. This step considers such physical characteristics of the training site as: light, ventilation, physical arrangements of seats, equipment, machinery, tools and technology.

E. The initiation of training by:
1. Starting the lesson on time.
2. Maintaining an open and pleasurable atmosphere.
3. Relating the lesson to other lessons, skills, previous programs, or professional experiences.
4. Using an appropriate point, experience, or event to begin the lesson with trainees.
5. Announcing the lesson title to trainees.

F. Implementing the lesson by :
1. Using the training plan as suggested in step (A).
2. Using the recommended questions and exercises to check the comprehension of trainees.
3. Balancing the use of lesson's time as it is distributed among different activities, so that no activity may run over into the time of another.
4. Distributing handouts or training materials if applicable.

G. Ending the lesson by:
1. Quick review of trainees' new achievements.
2. Conducting tests whenever necessary.
3. Correcting weaknesses and providing more time and experiences for adequate feedback and mastery of professional skills.

What Comes Next ?

Accomplishing the current designing task of the instruction of training, will pave the way to the next undertaking: the selection and description of human and material services which will be discussed in the coming chapter.

Chapter VII

The Design of Human and Material Services

Introduction

Human services of training incompasses trainers, experts, administrators, technicians, as well as secretarial, operating, and maintenance personnel .

Material Services on the other hand include all training factors other than the human elements, such as facilities, equipment, machinery, materials, media, technology, budgets, and work schedules .

The chapter handles the designing responsibility of these human and material services by six sequential steps which appear as follows .

Selecting and Describing Primary Training Personnel

Trainers, experts administrators are first degree training personnel. They are the primary operators of the professional program.

Form (19) specifies the types and numbers of the above working staff that fulfill the implementation needs of a training program. In actual designing, additional forms are essential for detailing the professional qualifications of the selected personnel .

The basic professional qualifications that could be considered in selecting and describing trainers, experts and administrators appear as follows:

Trainers Should Be:

1 . Professionally knowledgeable .
2 . Professionally skilled .
3. Knowledgeable of adult learning theories and techniques (Knowledgeable of andragogy).
4 . Able to communicate and interact with others appropriately and effectively .
5 . Flexible in personality, in receiving consructive criticism / feedback, and in responding to trainees needs.

Form (19): Selection and description of primary training personnel (Trainers, Experts & Administrators).

The job: Car driving Designer: .....

The Task: Car maintenance Administration: .....

No.s	Terminal behavioral objectives (Illustrative examples)	Trainers	Experts	Administrators
1	The trainee will maintain battery water of his car at all times with precision of 100%.	One battery technician.	One battery expert (if needed).	These could be the same for all program's objectives. Example of such administrators are: 1. Department manager. 2. Program coordinator. 3.Administrative personnel.
3	The trainee will check the adequacy of engine oil against the required level with precision of 100% in 3 mts.	One engine oil mechanic.	One engine oil expert (if needed).	
5	The trainee will be able to control engine temperature at all times by using different means learned in the training program.	One engine mechanic.	One engine expert (if needed).	
7	The trainee will maintain car brakes effectively by applying the means available to him.	One brakes mechanic.	One brakes expert (if needed).	
8.1	The trainee will park his car & display the caution sign in 3 mts. with 100% success.	One car driver.	One traffic officer (if needed).	
8.2	The trainee will bring all tools necessary for changing the tire with 100% success in 2 mts.	One flat tire mechanic	One maintenance specialist (if needed).	
8.3	The trainee will lift the car by jack in 3 mts. with 100% precision.	One flat tire mechanic	One maintenance specialist (if needed).	
8.4	The trainee will take off the flat tire & store it in trunk in 3 mts.	One flat tire mechanic.	One maintenance specialist (if needed).	
8.5	The trainee will place the good tire in its position & tighten screws in 3 mts. with 100% precision.	One flat tire mechanic.	One maintenance specialist (if needed).	
8.6	The trainee will lower & store all tools in their place within trunk in 2 mts.	One flat tire mechanic.	One maintenance specialist (if needed). mechanic.	

* From form 12.

Experts Should Be:

1 . Honest and confident in personality and professional intentions.
2 . Professional in the area of training.
3 . Fully knowledgeable of the training problems / needs of the organization.
4 . Persistent and capable of implementing the plans of the organization.

Administrators Should Be:

1 . Professional in their working areas.
2 . Systematized and objective in their administrative behaviors and interactions with others .
3 . Positive in their attitudes toward trainers, trainees, the training program and the organization.

Selecting and Describing Support Training Personnel

Support personnel are the secondary human resources who assist the primary staff in advancing the course of training. Support staff may include the following examples:

1 . Educational machir.e operators
2 . Mechanics
3 . Communication specialists
4 . Designers / developers of training materials
5 . Artists
6 . Equipments maintenance personnel
7 . Facilities maintenance personnel
8 . Typing / copying services
9 . Files / records services
10 . Personnel of spareparts and materials warehouses
11 . Public relations personnel
12 . Food / cafeteria staff
13 . Cleaning staff
14 . Health profesionals
15 . Car parking staff
16 . Reception staff
17 . Measurement / evaluation specialists

Form (20): Selection and description of training support personnel (Technicians, secretarial staff and maintenance services).

The job: ..... Designer: .....
The Task: ..... Administration: .....

Serial No.s	Terminal behavioral objectives	Technicians (illustrative examples)	Secretarial/ operating personnel (illustrative examples)	Maintenance personnel (illustrative examples)
1	The trainee will maintain battery water of his car at all times with precision of 100%.	Assistant technician	Records/ filing employee	General service worker
3	The trainee will check the adequacy of engine oil against the required level with precision of 100% in 3 mts.	Assistant technician	Worker/ aide	General service worker
5	The trainee will be able to control engine temperature at all times by using different means learned in the training program.	Coolling system, oil, engine & spare parts technicians.	Worker/ aide	General service worker
7	The trainee will maintain car brakes effectively by applying the means available to him.	Brakes repair technician, spare parts worker	Worker/ aide	General service worker
8.1	The trainee will park his car & display the caution sign in 3 mts. with 100% success.	Traffic officer.	Worker/ aide	General service worker
8.2	The trainee will bring all tools necessary for changing the tire with 100% success in 2 mts.	Assistant technician	Worker/ aide	General service worker
8.3	The trainee will lift the car by jack in 3 mts. with 100% precision.	Assistant technician	Records employee	General service worker
8.4	The trainee will take off the flat tire & store it in trunk in 3 mts.	Assistant technician	Records employee	General service worker
8.5	The trainee will place the good tire in its position & tighten screws in 3 mts with 100% precision.	Assistant technician	Records employee	General service worker
8.6	The trainee will lower & store all tools in their place within trunk in 2 mts.	Assistant technician	Records employee	General service worker

For practical reasons, the above types of support services are grouped within three categories: technicians, secretarial services and maintenance services (Refer to form 20).

When using form (20), the designer writes down in each category, the type and number of the support services needed to help in the process of translating training objectives into the mandated behavioral skills.

If machine operators are needed for example, the designer should specify along with the type, the number of these technicians who must be available to perform the maintenance job. He may write in this instance: one video operator, two projector operators, one photographer, two copy machines operators, ... etc.

After summarizing the types and numbers of support services in Form (20), the designer elaborates for each one: the professional characteristics and the selection criteria for training responsibilities.

Among the selection criteria (and professional characters) which could be considered here, are:

1 . Adequacy of professional qualifications for the required training tasks.
2 . Validity of qualifications to required training tasks.
3 . Dynamic of personality.
4 . Positivity of attitudes towards trainers, trainees, training and organization.

Selecting and Describing Training Facilities and Equipments

Training facilities are the physical spaces that are designed specially to host trainers, trainees, administrators, support services, the program, equipment and materials, while operating to develop the mandated professional skills.

Facilities are seen to be the bare buildings or any places which could be suitable for training, while equipment on the other hand, are all materialistic extras that permanently accompany facilities, therefore qualifying them psychologically, behaviorally and physically to hold the different aspects and processes of training.

Examples of training facilities are: working / practice rooms, media presentation halls, instructional rooms, micro - training labs, auditori-

Form (21): Selection and description of training facilities & equipments.

The job: ..... Designer: .....
The Task: ..... Administration: .....

Serial No.s	Terminal behavioral objectives	Training facilities (Illustrative examples)	Training equipments/ (Illustrative examples)
1	The trainee will maintain battery water of his car at all times with precision of 100%.	The mechanic workshop, training workshop (Electric department).	Light bulb; seating lounge (or corner); washing sink.
3	The trainee will check the adequacy of engine oil against the required level with precision of 100% in 3 mts.	The mechanic workshop, (oil dept.) instructional room.	Light bulb, seating lounge (or corner); washing sink; discharged dish or can.
5	The trainee will be able to control engine temperature at all times by using different means learned in the training program.	The mechanic workshop, training hall; instructional room.	Seating lounge; washing disk, lifting machine.
7	The trainee will maintain car brakes effectively by applying the means available to him.	The mechanic workshop, gas station or training hall (Brake dept.), Instructional room.	Car jacks; seating lounge; washing disk.
8.1	The trainee will park his car & display the caution sign in 3 mts. with 100% success.	Training hall, side road specified for training; mechanic workshop (repair dept.).	Caution sign.
8.2	The trainee will bring all tools necessary for changing the tire with 100% success in 2 mts.	As above.	As above.
8.3	The trainee will lift the car by jack in 3 mts. with 100% precision.	As above.	Car jack; caution sign.
8.4	The trainee will take off the flat tire & store it in trunk in 3 mts.	As above.	As above.
8.5	The trainee will place the good tire in its position & tighten screws in 3 mts. with 100% precision.	As above.	As above.
8.6	The trainee will lower & store all tools in their place within trunk in 2 mts.	As above.	As above.

ums; typewriter offices, zerox copying offices, still pictures, drawings, and artificial models labs, a / v centers, developmental centers of training materials, machinery repair / maintenance centers, training staff offices, computer centers, post offices and communication center, admissions office, bathrooms, general relations office, ware houses, hallways, surrounding yards and gardens.

For training equipment, the given samples follow: seating furniture, work furnitures, disks, carts, decorations, conditioning systems, internal (closed circuits) communication systems (e.g. phone , T.V. , radio), fire extinguishers, washing sinks, elevators, darkening systems, lighting systems, recreational media/machines within instructional rooms (e.g. overhead projectors).

Form (21) Summarizes facilities and equipment which could be, used in the implementation or terminal objectives. Descriptive details of professional characteristics, training roles, work timing throughout training, and selection criteria of these facilities and equipment for training should all be worked out in notes, to accompany the form.

Selecting and Describing Training Machinery and Materials

Training Machinerys is the hard ware or all the machines, tools, instruments and devices which trainers, trainees and working staff use in the developmental course of required professional skills. Training materials, on the other hand, are the software or raw and pre-fabricated matter, stuffs, substances, objects or mediums that are deemed necessary to the processing of behavioral objectives.

Examples of training machinerys are: educational machines, technological instruments, production - operation machines and tools, repair / maintenance tools, spare parts, measurement devices, computers and their perepheral hardware, photography, drawing, photo-copy and printing machines and instruments, cleaning tools.

Training materials could be: stationery, liquid, oils, soaps, towels wood stuffs and objects, colors, powders, writing notes, work books, printed matter, references, audio materials, computer soft ware, projected media, non-projected media, educational samples and models.

Form (22) presents the training machinery and materials which are suitable for the implementation of professional behavioral objectives.

Form (22): Selection and description of training machinery & materials.

The job: ..... Designer: .....

The Task: ..... Administration: .....

Serial No.s	Terminal behavioral objectives	Training machinery (illustrative examples)	Training materials (illustrative examples)
1	The trainee will maintain battery water of his car at all times with precision of 100%.		Observation/ evaluation tool or list*
3	The trainee will check the adequacy of engine oil against the required level with precision of 100% in 3 mts.		A sponge or piece of cloth; observation/ evaluation list*
5	The trainee will be able to control engine temperature at all times by using different means learned in the training program.	Screw drivers	Cleaning towel; observation/ evaluation list
7	The trainee will maintain car brakes effectively by applying the means available to him.	Screw drivers; car jack, spare brakes parts	Cleaning towel; observation/ evaluation list
8.1	The trainee will park his car & display the caution sign in 3 mts. with 100% success.		
8.2	The trainee will bring all tools necessary for changing the tire with 100% success in 2 mts.	Screw drivers; car jack, tire screws	Cleaning towel; observation list
8.3	The trainee will lift the car by jack in 3 mts. with 100% precision.	Car jack	Observation list
8.4	The trainee will take off the flat tire & store it in trunk in 3 mts.		
8.5	The trainee will place the good tire in its position & tighten screws in 3 mts. with 100% precision.	Screw drivers; good tire	Observation list
8.6	The trainee will lower & store all tools in their place within trunk in 2 mts.	Screw drivers	Cleaning towel; soap; observation/ evaluation list

* Contains the behavioral steps which are required for the performance of training objectives.

As the case of previous forms, the designer could split the current form into two: the first to specialize in machinery and the second to embody the materials.

What is really needed, however, from the designer after projecting the above appropriate services is to elaborate the qualitative and quantitative descriptions of every machine and material selected for training. These details of course will ease the implementation of the professional program by administrators, trainers and training staff, in general.

While the types of facilities and materials are determined by the behavioral nature of the program's objectives, the quantity of these services could be decided by the number of trainees participating in the program.

It may be inferred, in this regard, that a large number of trainees will lead to the formation of several training groups or classes, needing a variety of machinery and materials to serve their professional activities. Moreover, other criteria suggested at the end of the chapter could be applied here.

Assessing The Overall Budget of Training

Time is appropriate now for the designer to look back at different training factors and processes for the assessment of their financial costs. in order to establish the overall budget of the professional program.

As form (23) shows, the training program budget covers all the human and material services, and its various activities from needs assessment to evaluation of productivity.

The training costs however could be classified within three categories:

1 . Direct costs, e.g., salaries for human resources, leasing, buying costs of material services, fees of training.
2 . Hidden or indirect costs, e.g. the use depletion costs of material services concerning facilities, equipment, machinerys, technology, media, materials, tools, salaries of trainees.
3 . Covering costs, e.g. storing costs, price increase costs of materials, travel, transportation and hotel costs, etc .

When assessing the budget of training, the designer may notice the following principles:

1 . Calculating the budget based on all training costs - direct, and hidden or covering costs.
2 . Suggesting extra 10 % of the assessed budget, as petty cash, whenever possible, to cover emergencies that could arise throughout training. This amount if not needed, should be kept in treasury in order to serve the same purpose for the next program.
3 . Training costs tend to increase as the program period tends to be long.
4 . Training costs tend to decrease as the program is applied repeatedly with other groups of trainees.
5 . Detailing the assessment of budget as much as possible for the purpose of getting concise results.

Form (23a): Selection and description of training machinery & materials.

The job: ..... Designer: .....
The Task: ..... Administration: .....

Training factors / Training processes	Human services	Media & materials	Machinery & technology	Facilities & equipment	Row totals
Needs assessment for training					
Program planing					
Program / materials development					
Program implementation					
Program Evaluation					
Column totals					Grand total

Form (23b): Assessment of the overall budget of training (human services)

The job: .....

The task: .....

Training factors / Training activities	Administrators	Trainers	Experts	Technicians	Secretarial personnel	Maintenance personnel	Row totals
Needs assessment for training							
Program planning							
Program materials development							
Program implementation							
Program evaluation							
Column totals							grand total

Form (23c): Assessment of the overall budget of planning training (Human and material services).

The job: .....

The task: .....

Training factors / Training activities	Administrators	Trainers	Experts	Technicians	Secretarial services	Maintenance services	Facilities & equipment	Machinery & technology	Media & materials	Row totals
Needs assessment for training										
Program planning										
Column totals										grand total

Different sub - forms as (shown by forms 23b and 23c) could be derived, representing various factors and activities of training. Cost values of sub - forms are summed up to produce the grand total of the budget.

Designing the Timetable/Program Guide of Training .

The timetable and program - guide are condensed, descriptive forms of the most important factors and processes which make up the training program. These major factors and processes may be easily depicted in forms 24 a and 24 b.

Form (24a): Designing the timetable of training lessons.

Institute: ..... The program: .....

Departments: ..... The Period: .....

No.s	Professional acts (skills, sessions or lessons)	Trainers	Sites	Dates
1	Battery water			
2	Radiator water			
3	Engine oil			
4	Wheel oil			
5	Engine Temperature			
6	Car lights			
7	Car brakes			
8	Flat tires			
9	Car locks			
10	Car cleanliness			

Form (24b): Designing the program-guide of training.

Institute: ..... The program: .....

Department: ..... The Period: .....

Objectives:
Behavioral or generic objectives could be written in this section.

Trainees and Program Pre-requisites
Types of trainees & pre-conditions that they should possess or conform to, before entering the program (e.g. professional experiences, courses, workshops, achievement levels, grades or specific age).

Trainers:
Names of trainers (and their professional qualifications if appropriate) may be written here.

Training lessons:
Training topics, skills, job acts or tasks are briefly written in this paragraph.

Training facilities:
Main training sites, rooms, laboratories, and practice centers are listed here.

Training activities/achievement requirements:
Major activities, projects and experiences expected from trainees and their achievement values; tests which will be administered; and attendance-participation requirements, could be written here.

Training Resources:
Training notes, handouts, packages, textbooks, references, guide/work-books, may be written in this concluding section.

The purposes which may be served by the time- table and program-guide in training are briefly :

1 . Information mechanism that communicates knowledge, news or any training data which could benefit the work of trainees. The time table and program - guide function as a data disseminating tool.

2 . Advertizing mechanism which may further the professional status, role or reputation of a training institution.
The direct result of this process is an attitudinal change of the concerned parties that leads normally to more support, praise or acceptance of training and institution.
As a result, people know something about the training program without definite actions expected from them. It is somewhat personal knowledge that is passive in nature.

3 . Action - guide mechanism which serves as a directing - focusing device throughout training. Training personnel may use the time - table or program guide as handy references of what is involved or required in training.

The designer can adopt any reasonable scheme to present form (24) that may better suit his training case. The most important point he should watch when structuring the needed time table or program - guide however, is its ability to portray the basic components (factors and processes) of the training program.

Quantitive Criteria for Selecting Human Services Needed by Training

As for the number of trainers, experts, administrators and technicians whom are needed by a training program, several criteria could be applied:

1 . The behavioral complexity of a training program. If the program is composed, for example, of different tasks and professional skills, then more personnel are needed for using the diverse training materials, facilities, equipment, machinery, and for translating the various skills embedded in the statements of objectives into observable working behaviors.

2 . Number of trainees. The more trainees entering the professional program, the more trainers, experts and administrators are needed.

3 . Multiplicity of training sites and implementation requirements. The more of these, again the more personnel are needed for the program.

4 . The professional competency of trainers. The less competent the trainers, the more of them are needed to fulfill the expected training responsibilities.

5. The financial capabilities of the organization to fund the training program. If more money is available, then more professional personnel could be recruited to implement the program. The more restricted budget on the other hand, will force the organization to cut down the number of human services needed by the program to their possible lower levels.

What Comes Next

Now, with the selection and description of human and material services necessary for the conduct of training, the road is paved to move to other training pursuits: that is, designing the training document, program marketing, and the preparation for implementation which will be disscussed in the next chapter (8).

Part III: Designing Program Dissemination and Evaluation

8. **Designing the Training Document, Program Marketing & Preparation For Implementation.**
9. **Designing the Evaluation of Training - Program's Productivity & Validity.**

Chapter VIII

Designing the Training Document, Program Marketing and Preparation for Implementation

Introduction

Based on the designing data of the previous chapters, time is appropriate now to write the program document, to initiate the program marketing, and to launch preparatory activities for the implementation of training.

This chapter, while concentrating on the mechanics of writing a training document, presents briefly the organizational guidelines for both program marketing and implementation.

Writing the Training Document

The training document is the finalized and articulated record of all factors and processes involved in a professional development program. It could appear in the form of audio tapes or compact discs, a set of hand-outs, slides or transparencies, a work package, a set of video cassettes, 8mm or 16mm films, filmstrips, microfilms or microfiches; or computer materials.

The conventional presentation form of a training document however, is a written one. This form is widely prevailing in the fields of education and training, despite recent technological advances. Hence, the projected designing guidelines in the chapter will be limited to this popular written form . These guidelines involve eleven major steps, depicted in figure 1 and are illustrated in the following paragraphs.

Step One: Writing the Program's Title and Primary Introductory Data.

The designer composes in this step the cover pages by writing. The program's title, the training institute, the publishing / issuing date, the training period (e.g March 1 - 21, 1992); and other related data.

On the next page or two , the table of contents, and the list of figures and tables are stated , particularly when the training program is clearly long and complex .

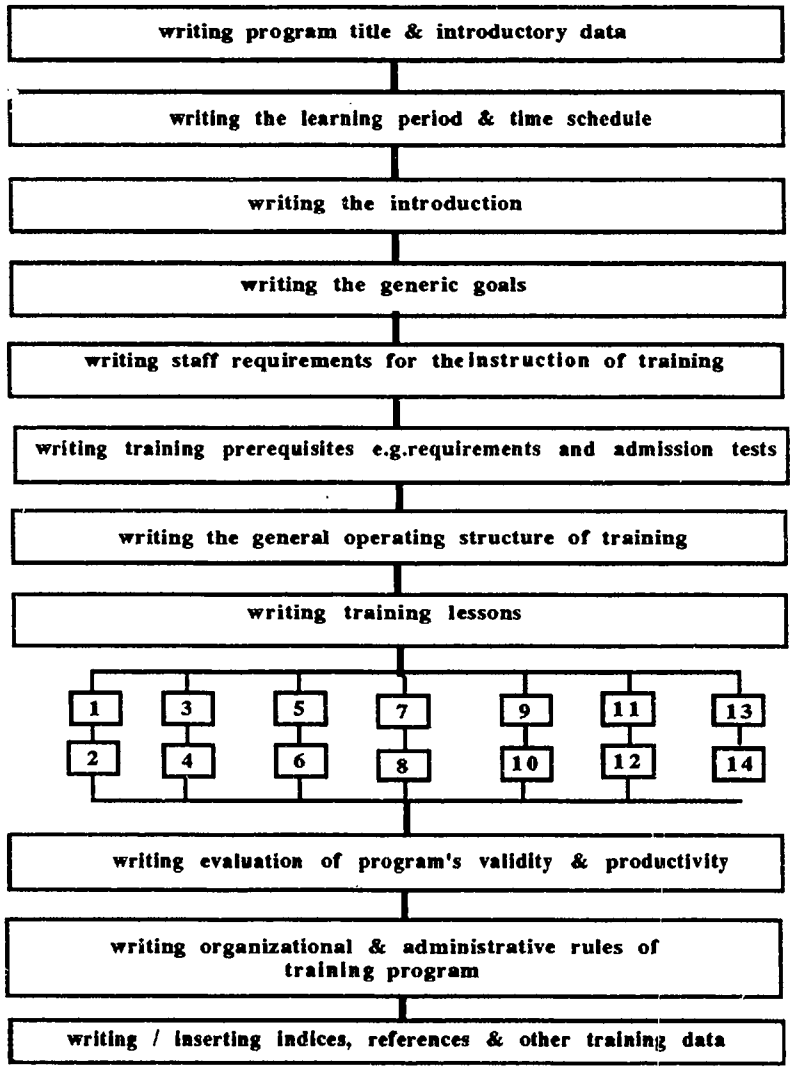


Figure I: Projected components & sequence of writing a training program.

Step Two: Writing the Training Period and Time Schedule.

The training period is the time limits in which the program will operate by the sponsored institution. This period is stated usually in hours, days, weeks or months.

The time schedule, on the other hand, is the time table during which training activities will take place through its sub - periods. Summing up these periods will lead essentially to the grand total time of training.

To write this paragraph, the designer may state: "The program will operate within a three-week period, starting from March 1st through the 15th, 1992. Training sessions will take place daily, monday through Friday, from 8 o'clock in the morning to 5:00 in the afternoon.

If work - holidays occur during the training period, it should be specified independently by separate statement or within the weekly schedule which, preferably, concludes the current paragraph. The time - table constructed previously in chapter VII could suffice for the purpose here .

Step Three: Writing The Program Introduction.

The introduction is the key to presenting and understanding the training program. it is the prelude to the psychological / cognitive acceptance by readers whether these are trainees, trainers or training personnel. Consequently, it should be written in a language that is:

1 . Logical in presentation, objective in facts and terminology, and not directive nor contradictory.
2 . Reasonable in length. It should not be short to the extent that it is incapable of presenting training information satisfyingly. Likewise, it should not be too long, thus stimulating resentment or turn-over from reading it, or the loss or misplacement of some important facts as a result of presenting too much unnecessary information.
It is suggested accordingly, that the introduction to be about one page when the training program is relatively simple and short in its structure. Two to three pages are sufficient when a program is generally novel, complex, or very important in content and seemingly difficult to achieve.

3 . Useful, comprehensive and compatible in presenting the training topic. For the introduction to be convincing, it should be logical and comprehensive in presentation, and compatible in information content.

To achieve these characteristics in the introduction, the designer may consider the following points:

* Program back-ground: where it came from and the general professional needs which led to its existence.
* Type of employees or trainees that will participate in the program.
* Appropriate number of participants in the program.
* Main program outlines or components.
* Behavioral or professional significance which the program will contribute to the future employees, and the organization of the job.
* The program's general status relative to past, current, and future training.

4 . Chronologically sequenced. The content should represent the three time cycles: the past, present and future of the training program and professional development. Following the points suggested in paragraph 3 above may help the designer to achieve this introductory time sequence.

Step Four: Writing the Generic Goals.

Generic goals are composite statements representing a mixture of professional skills which trainees should achieve as a result of the training program. The skills of one goal embody a harmonious configuration of cognitive, affective- social and psychomotor behaviors.

Due to the behavioral multiplicity of these goals, their statements are broken down into ones which are more specific and limited in content. These are called usually, the terminal and formative behavioral objectives (Refer to chapter 5).

Regardless of the nature of generic goals, the designer, when presenting them in this paragraph, should maintain their implementation sequence within program. He may state: "Participants are expected to achieve as a result of program's administration, the following goals:

1 . .....
2 . .....

3 . .....
4 . .....
5 . .....

Step Five: Writing Training Prerequisites

Training prerequisites are of two main types: admission requirements of trainees to program, and admission tests.

Admission requirements to training program

Every new learning endeavor requires specific post-learning experiences to be based on and to increase its achievement. Professional skills which are sought by training, comply essentially with this rule. Thus, the achievement of these skills necessates that trainees have different prerequisites, such as:

1 . Physical / psycho-motors characteristics, e.g. fine hand skills; coordination of sight and hand movements;and stamina.
2 . Cognitive characteristics . e.g. special and general intelligence, cognitive abilities (knowledge comprehension, application, analysis, synthesis or evaluation), type of cognitive level (enacative, iconic and symbolic).
3 . Psychological characteristics e.g. professional attitudes, locus of control, persistence and concentration.
4 . Academic achievements: e.g. professional courses, workshops or diplomas, achievement grades, and work experiences.
5 . Training institution requirements: Training institutions do require some times special conditions for entry to their programs, e.g. specific age category, private or governmental sector, men or woman, achievement of particular course, materials or skills specific for professional level, population segment, race or geographic region.

All above admission prerequisites and possible others, should be spelled out by the designer, so that they will be completely clear and understood perfectly later by practitioners.

Admission tests :

Admission tests could be written, oral or academic performance exams, personal interviews, or merely answering written questionnaires. The results of these tests benefit training in two respects:

1 . Sorting employees into acceptable and rejected categories of trainees.
2 . Sorting novice trainees into homogeneous levels of achievement, hence responding to the demands of each level accordingly.

When writing admission tests for the training document, the designer should:

* Describe their contents, roles, strengths and weaknesses.
* Present application steps.
* Provide the standard answers.
* Provide a copy of each test. If the context of the current paragraph is not able to hold the test copies, especially when they are diverse and long, the designer then consider putting them in specific indices at the end of the training document. This suggestion applies as well to admission requirements stated previously.

Step Six: Writing Staff Requirements for The Instruction of Training

Admission or working prerequisites to a training program are not limited to trainees, rather they should be extended to trainers, administrators, technicians and other personnel. The training caore should also have the required personal and professional qualifications before they could be accredited to training roles. These requirements may be summed as follows:

1 . Specialized knowledge in training topics.
2 . Professionalism in teaching training subjects (e.g. methods , principles , media and admiministation).
3 . Practical knowledge in andragogy.
4 . Practical skill in the evaluation of achievement / productivity.

Staff requirements must be detailed like any other component of the program. "Qualifications of training staff" could be a suitable title of this paragraph.

Step Seven: Writing the General Structure of the Training Program

This paragraph is not obligatory for the program document, though it is beneficial as an introductory statement to training lessons later.

When writing the paragraph, several principles may be noted:

1 . Be very brief.
2 . Be supported with illustrative drawings and tables.
3 . present general information, so that training facts are not literally repeated in other paragraphs, especially, the training lessons.

If the job: Car driving (the illustrative example throughout this book) is considered. The paragraph of the training document could appear as follows:

"The training program "car driving", is composed of three behavioral units: driving on the road for a four-week period (one week on-campus and three weeks off-campus training); car maintenance for one week; and observation of traffic and safety laws for one week. Driver training will continue off-campus on actual roads for three weeks during which maintenance skills and observance of traffic and safety laws will be applied. The training program with its tri-components, can be represented diagrammatically in figure II :

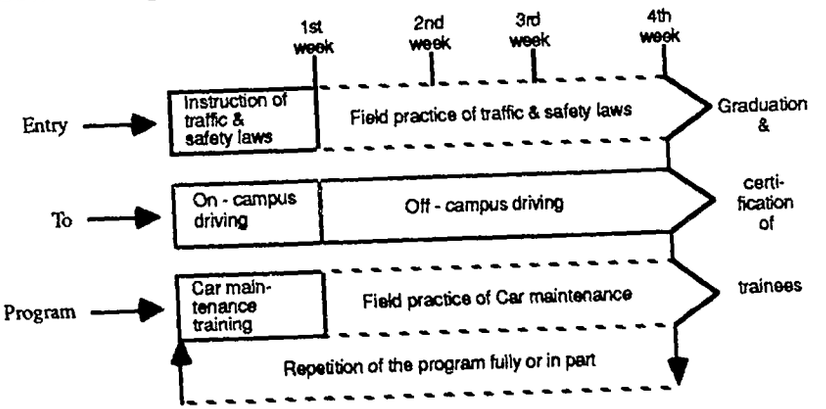


Figure II: General curricular & operational structure of training program - Car driving.

Training on car maintenance will be implemented on-campus within the mechanic workshop. Traffic and safety laws will be instructed in demonstration rooms equiped with boards, video films, slides and transparency kits, and simulatiors. Finally, a car driving unit will be implemented at the special facilities of the city traffic department for one week period, then will continue off-campus, coupled with car maintenance, and traffic and safety laws, for three weeks.

Three categories of trainers are available to conduct the program: Instructions of traffic and safety laws, maintenance technicians, and road driving trainers."

Step Eight: Writing Training Lessons

Training lessons are working sessions through which the program is administered and trainees usually develop their required professional skills.

For composing training lessons, the designer may consider the following elements:

1 . The lesson's serial number , and title within the training program .
2 . The date of its implementation
3 . The training period in hours or minutes
4 . The general goal and behavioral objective
5 . Trainees achievement prerequisites. e.g. concepts, skills or previous lessons
6 . Required training knowledge
7 . Activities and exercises of trainees, including projects, assignments and practice which they will undertake, for the purpose of achievement, and graduation.
8 . Types and procedures of formative evaluation and summative tests or performances expected from trainees at the end of the training program.
9 . The instruction of training which includes:
   * Necessary human resources in types and numbers commensurate with their roles throughout training.
   * Main training methods which may be used in implementing each lesson.

   * Training media and technology, both the basic and support ones.
   * Training sites or facilities which will be used by each lesson.
   * Trainees' materials, e.g. notes, handouts, textbooks, references, programmed materials, training packages, movies, video films, audio tapes, etc.
   * Trainers references. e.g. the program document, the trainers guidebooks, training packages, etc.

When writing training lessons, the designer takes into consideration the following principles:

1 . Writing each lesson's element to its finest details. Training lessons should be self - performing tools by both trainers and trainees . one more reason to detail training lessons is to respond to different ligh/ low professional qualifications of trainers and other program personnel .
2 . Describing the developmental steps of non - commercial media and materials, so that technicians and program support services will be helped later while developing these training tools .
3 . Describing the qualifications of human resources, e.g. types and qualities, numbers of each needed by each lesson, expected training roles .
4 . Describing the training facilities, equipments, machinery, technology and references, taking into account the behavioral needs which be fulfilled by each. If appropriate, the possible dates during which these services be employed in training, should be included .
5 . Differentiating the presentation forms of training lessons . They should not be limited to written ones. Instead, other forms may be adopted, such as : mini-courses, micro-training units, training packages, behavioral units (or training by objectives units), motion picture units (e.g. video, 8 mm or 16 mm films), computer-assisted training units, audio slide kits and many others .
6 . Providing lesson's texts with illustrative drawings, pictures, graphics and tables whereever appropriate .
7 . Opening the lesson with a general statement representing its intent (s), main act / acts or professional skills, and closing, with a brief, meaningful summary .

Step Nine: Writing Evaluation of Program's Validity and Productivity

Program's validity means here its behavioral representation of professional needs of trainees. While productivity denotes the program's ability to produce the required skills .

Chapter (9) specialises in the treatment of above topics . The designer considers however while writing this paragraph , all principles , procedures and instruments deemed necessary for determining the program's validity and productivity. Actual instruments or tools could be inserted in special indices at the end of the training document .

Step Ten: Writing Organizational & Administrative Rules of the Training Program

Training like any other constructive human behavior, needs some directions, focusing principles / procedures coordination, supervision and guidance. Consequently, rules governing the daily aspects or activities of training should be specified in the document, and then, handed later to trainees at the beginning of program implementation. These organizational and administrative procedures could be :

1. Types and techniques of supervision adopted throughout training.
2. Security and safety rules of attending the training sites or facilite.
3. Rules of using training materials and machineys .
4. Rules of housing and meals (of room and board) .
5. Rules of communication with the external world .
6. Rules of participation in training sessions .
7. Rules of general accetable conduct throughout training .
8. Rules of attendance and absenteeism .
9. Rules of emergency holidays .
10. Rejection rules from training program.
11. Rules of graduation and certification .
12. Rules of using the car parking lot .

Step Eleven: Writing/Inserting Indices, References and Other Training Peripherals

This paragraph is a concluding section of the training document, it contains besides the references, all the materials, instruments, tools, questionnaires and tests that cannot be included within the texts of above ten paragraphs of the training document .

The Design of Program Marketing

Program marketing is the process of advertisement through which a training program is introduced to professional communities in public and private sectors, by means of newspapers, magazines, posters, T.V / Radio announcements, personal interviews, invitation letters, electronic (tele - communication) messages, periodical ads, or field visitations .

The intended result from the use of these procedures, is the adoption of the training program by concerned parties .

Usually, the mailing letters or handouts are carried out by the training institution in advertising the program to selected parties. These invitation / announcement mediums may briefly contain the following elements[1] :

1 . Title of program .
2 . Date, period and site (s) of implementation .
3 . Trainer or coordinator of the program .
4 . Main out-lines or goals of the program .
5 . Participants' gualifications .
6 . Registration date and fees (if applicable) .
7 . Procedural steps of the program's request or registration .
8 . Address (persons, P. O. Box, telephones, telex, fax) by which registration is possible .

Preparation for Program Implementation

Implementation of training is the act of administering the designed program with trainees by employing all suggested human services such as trainees, administrators, experts, technicians, secretarial and maintenance personnel; and material services such as facilities, equipments machinery, technology, media and materials, budget and time schedules.

Considering all of the above, preparation for training implementation covers the following concerns :

1 . The preparation of materials, media and technology .
2 . The preparation of facilities .
3 . The preparation of tools and machinery .
4 . The preparation of written, raw and pre - fabricated materials, including text books, work books, handouts, references, etc .
5 . The preparation of rules and guidelines of organizing and administering training .
6 . The preparation of different human services by providing them with training rules and materials; and holding preparatory / training sessions (short and intensive sessions) with any personnel who may need them .
7 . The preparation of daily plans of training .
8 . The preparation and organization of experts and specialists' participations .
9 . The preparation of appropriate internal / external systems of communication .
10 . The preparation of transportation .
11 . The preparation of housing and food services .
12 . The preparation of general and recreational services .

Implementation of training on the other hand, takes general steps as:

1 . Reviewing the readiness of all concerned human and material services for the commencement of training, with instant supply or modification whereever deemed necessary .
2 . Holding a general meeting with trainees to acquaint them with the program, the training faculty, and working facilities. Trainees will be accompanied during a quick tour, showing them the training facilities and sites .
3 . Administering of pre - training academic tests to determine the back-ground knowledge and skills of trainees .
4 . Sorting trainees into homogenious groups in order to respond to their professional needs accordingly .
5 . Distributing the training schedule, handouts and other appropriate materials. Trainers instructional plans should also be handed to trainees .

6 . Administering training program with trainees according to document, plans and the prepared human and material services .
7 . Evaluation of trainees achievement and program's validily / productivity according to suggested plans .

What Comes Next ?

Now , the training document is concrete and ready for operation . The human and material services are qualified and prepared for work. The program is marketed to concerned communities / parties and will be administered with trainees as is planned .

What it is left to be done after actual implementation is to evaluate the validity of the program to trainees needs and essentially, specifying its effectiveness in producing the required professional skills . The concluding chapter of this book (chapter 9) specializes in above evaluation tasks .

Chapter IX

Designing the Evaluation of Training - Program's Productivity and Validity

Introduction

Evaluation of training is the process of weighing its behavioral values against specific criteria. When these criteria are concerned with program's effectiveness or ability to produce the desirable outcomes, then the act is called evaluation of effects, or product evaluation.

When criteria on the other hand, probe program's ability to represent professional needs of trainees, the weighing of training consequently denotes the evaluation of the program's validity (refer to last paragraph before the end of the chapter).

The current chapter treats briefly the evaluation of training productivity and validity; giving more attention to the practical aspects of these important issues.

Types and Purposes of Training Evaluation

Program's evaluation, besides above two major types, could be, according to its occurance throughout training, of three kinds :

The first : pre-entry, analytic, or needs assessment evaluation which leads to the formation of the training program.

The second : formative evaluation which concerns itself with building up and improving the trainees' achievement of required professional skills; thus guiding, revising or upgrading what is deemed necessary for training in regard to human and material resources.

The third: summative or final evaluation which occurs at the end of training,e.g., identify trainees as having passed or failed according to the evaluative criteria.

Whatever the types of training evaluation may be, the main purposes of it, are* :

* Trainig embraces all factors & processes involved in a professional development program. The projected purposes therefore concern these components individually and as a whole.

Table (1): A summary of training evaluation's domains, types, parameters & tools (illustrative examples).

Evaluation domains	Productivity evaluation	Validity evaluation	Evaluation parameters	Evaluation tools	Notes
A. Training aim (goals, knowledge, learning & evaluation activities).	1. New professional skills. 2. New attitudes. 3. New products. 4. New services.	1. Congruence with trainees characteristics. 2. Representation of trainees' needs.	1. Achievement of required skills. 2. Reactions of trainees. 3. Satisfaction of trainees needs. 4. Satisfaction of organization. 5. Job productivity.	1. On the job performance. 2. Oral, writen & performance test. 3. Simulation materials & games. 4. Projects, reports, case studies. 5. Personal interviews. 6. Questionnaires. 7. Surveys & inventories.	Where same elements are applied, the principle of "best fit" must be practiced.
B. The instruction of training (media, methods & technology).	1. New professional skills. 2. New attitudes. 3. New products. 4. New services.	1. Congruence with trainees characteristics. 2. Congruence with achievement requirements. 3. Representation of training content.	1. Achievement of required skills. 2. Reactions of trainees. 3. Satisfaction of trainees needs. 4. Satisfaction of organization. 5. Job productivity.	1. On the job performance. 2. Oral, writen & performance test. 3. Simulation materials & games. 4. Projects, reports, case studies. 5. Personal interviews. 6. Questionnaires. 7. Surveys & inventories.	
C. Human services (trainers, administrators, experts, technician, secretarial & maintenance personnel).	1. New professional skills. 2. New attitudes. 3. New products. 4. New services.	1. Behavioral congruence with trainees characteristics. 2. Quantitative congruence with number of trainees (or requirements of program implementation). 3. Behavioral congruence with achievement requirements.	1. Achievement of required skills. 2. Reactions of trainees. 3. Satisfaction of trainees needs. 4. Satisfaction of organization. 5. Job productivity.	1. On the job performance. 2. Oral, writen & performance test. 3. Simulation materials & games. 4. Projects, reports, case studies. 5. Personal interviews. 6. Questionnaires. 7. Surveys & inventories.	
D. Material services (facilities, equipment, machinery, technology, media & materials)	1. New professional skills. 2. New attitudes. 3. New products. 4. New services.	1. Physical congruence with the nature of training skills. 2. Operational congruence with achievement requirements. 3. Quantitative congruence with number of trainees.	1. Achievement of required skills. 2. Reactions of trainees. 3. Satisfaction of trainees needs. 4. Satisfaction of organization. 5. Job productivity.	1. On the job performance. 2. Oral, writen & performance test. 3. Simulation materials & games. 4. Projects, reports, case studies. 5. Personal interviews. 6. Questionnaires. 7. Surveys & inventories.	

1. Specification of training productivity.
2. Specification of training validity.
3. Steering training to achieve proposed goals.
4. Improving the quality of training.
5. Justification of training roles, plans and cost to the public, concerned institutions, or governmental agencies.

Tool (I) : A bridged tool for evaluating training lessons of prospective trainers.

Trainee (Novice Trainer): ..... Training topic: .....
Major or job: ..... Time and date: .....
Work site: ..... Observer: .....

Trainer's Activities & characteristics	Weak 2	Fair 4	Good 6	V. good 8	Excellent 10	Sub-ratings
1. Preparation for training.						
2. Motivation of trainees.						
3. Skill in using individual training methods.						
4. Skill in using small group methods.						
5. Skill in using large group methods.						
6. Skill in using training media & technology.						
7. Skill in using appropriate evaluation methods & techniques.						
8. Encouragement of trainees' participation.						
9. Classroom management.						
10. General domeanor during training.						
Notes:					Grand total	100

Measures and Tools of Training Evaluation

Measures and tools which are often used in the evaluation of the training, are briefed below [1] :

1. Oral tests.
2. Performance tests. e.g. exercises, basket decisions, demonstrations, and simulation acts.
3. Reports, projects and research studies.
4. Individual measures e.g. evaluation by objectives, performance editing, individual testing and interviews.
5. Comparative measures. e.g. rating of trainees' performance, dual comparison (trainee with trainee), evaluation by the normal curve, z scores, and stannines.
6. Absolute qualitative measures.e.g. job accidents technique, behavioral lists, and forced choice tests.
7. Absolute statistical measures. e.g. rating scales and lists, behavioral surveys and inventories, and cost - benefit analysis.

Sample Tools of Training Evaluation

Training evaluation does not limit itself to trainees' performance or skill achievement. Rather, it extends responsibilities to their reactions (or attitudes) toward the program, trainers and training faculty, human and material support services, and the value of behavioral returns to their professional future.

In the following paragraphs, three different tools are presented as illustrative samples of what is available for the evaluation of training.

Abridged Tool for Evaluation of Trainer and Training Lessons

This simple tool (Tool I) was developed by the author as a trainer in the Institute of Public Administration in Riyadh, Saudi Arabia, in order to be used in a training program under a title: "Development of trainers' skills".

An Evaluative Tool of Trainees' Reactions Toward a Training Program [2].

This comprehensive opinionnaire (Tool II) portrays most factors and processes of training. Thus, when used properly, it may pinpoint their gaps and weaknesses, leading to the needed improvement of training.

Tool (II) : An evaluative tool of trainees' attitudes toward training.

Trainee: ..... The program: .....
Job: ..... Instiution: .....
Organization: ..... Date: .....

A. Considering every thing you have experienced during training, what is your rating of the program ? Put (√) where suitable :
Not useful ☐ useful ☐ very useful ☐ excellent ☐

B. Were your expectations of the training program? put (√) where suitable:
Surpassed ☐ matched ☐ below what you expected ☐
Could you please explain the reasons for your rating?
1. .....
2. .....
3. .....

C. Rate the following (0 = Nil, 1 = Weak, 2 = Acceptable, 3 = Good, 4 = V. good, 5 = Excellent):

____ 1. Microtraining.
____ 2. Individual tutoring.
____ 3. Individual prescription.
____ 4. Modeling.
____ 5. Programmed training.
____ 6. Small group discussion.
____ 7. Training exercises.
____ 8. Case studies.
____ 9. Questions.
____ 10. Sequencing training.
____ 11. Peer training.
____ 12. Field visitation.
____ 13. On-job training.
____ 14. Job games.
____ 15. Simulation acts.
____ 16. Demonstration.
____ 17. Job accidents.
____ 18. Projects, reports & studies.
____ 20. Lecturing.
____ 21. Apprenticing.
____ 22. Training by objectives.
____ 23. Competency-based training.
____ 24. Basket decisions.

D. Rate the following elements (0 = Nil, 1 = Weak, 2 = Acceptable, 3 = Good, 4 = V. good, 5 = Excellent):

____ 1. Communivcation with others.
____ 2. Attitude towards others.
____ 3. Motivation of trainees.
____ 4. Committment to time schedule.
____ 5. Enthusiasm to training topic.
____ 6. Depth in training subject.
____ 7. Using media & technology.
____ 8. Using handouts & materials.
____ 9. Organization of training enviroment.
____ 10. Evaluating & guiding training.

Tool II :

E. Ratio of lecturing to other methods (put (√) where suitable):
High ☐ Moderate ☐ Low ☐

F. Time ratio of using media & technology during the period of training (put (√) where suitable):
Most of the time ☐ Half of the time ☐ One quarter of the time ☐ Almost nil ☐

G. The tasks during training were (put (√) where suitable):
1. General tasks were: Heavy ☐ Appropriate ☐ Light ☐ Nil ☐
2. Case studies: Diverse ☐ Moderate ☐ Light ☐ Nil ☐
3. Training assignments: Too many ☐ Moderate ☐ Light ☐ Nil ☐

H. Rate the following trainers according to their individual performance & attitudes during training:

Trainers	A	B	C	D	F	Notes
1.						
2.						
3.						
4.						
5.						

Your suggestions for improvement:

An Evaluative Tool of the Organization's Improvement as a Result of Training :

Tool III: Assessment of organization's improvement as a result of training.

Organization: _____ Observer: _____
Specialty: ..... Date: .....

*put (√) in the appropriate box of every statement below.				Criterion status
1. Operation & Maintenance costs become:	More ☐	Average ☐	Lower ☐	Lower ☐
2. Personal & job tensions become:	More ☐	Average ☐	Lower ☐	Lower ☐
3. Work accidents become:	More ☐	Average ☐	Lower ☐	Lower ☐
4. Complaints about working conditions become:	More ☐	Average ☐	Lower ☐	Lower ☐
5. Work absenteeism becomes:	More ☐	Average ☐	Lower ☐	Lower ☐
6. Partial dropouts from work become:	More ☐	Average ☐	Lower ☐	Lower ☐
7. Complete dropouts from work become:	More ☐	Average ☐	Lower ☐	Lower ☐
8. Customers' complaints become:	More ☐	Average ☐	Lower ☐	Lower ☐
9. Time necessary for mastery of work becomes:	More ☐	Average ☐	Lower ☐	Lower ☐
10. Performance reports of employees become:	Better ☐	Average ☐	Worse ☐	Better ☐
11. Organization's performance/merchandise become:	Higher ☐	Average ☐	Lower ☐	Higher ☐
12. Organization's profits/reputation become:	More ☐	Average ☐	Lower ☐	More ☐
13. Quality of products/services become:	Higher ☐	Average ☐	Worse ☐	Higher ☐
14. Quality of products/services become:	More ☐	Average ☐	Worse ☐	More ☐
15. Employees participation in organization's daily life becomes:	More ☐	Average ☐	Worse ☐	More ☐
16. Operating capacity of organization becomes:	Higher ☐	Average ☐	Lower ☐	Higher ☐
17. The working routine becomes:	More ☐	Average ☐	Lower ☐	Lower ☐
18. Employees' problems & excuse become:	More ☐	Average ☐	Lower ☐	Lower ☐
19. Human relations within the organization become:	Easier ☐	Average ☐	Harder ☐	Easier ☐
20 New customers/recepients become:	More ☐	Average ☐	Lower ☐	More ☐

Notes:

$$\text{Improvement ratio} = \frac{\text{Total of discrepant elements}}{\text{Total of corresponding \& discrepant elements}}$$

$$= \frac{\text{discrepant elements}}{\text{Scale elements}}$$

Evaluation of Program's Productivity With Cost - Benefit Analysis

To specify the program's productivity, one should know, first, how much it cost and the professional returns which are produced in forms of new skills, attitudes, and knowledge.

Program costs must include every penny paid by both employers and training institutions. These costs could be direct expenditure as part of the allocated budget, and indirect as the case of covering expenses, trainees salaries during training, organization's loss of products / services as a result of employees leave for training.

For evaluation of the program's productivity with cost - benefit analysis, four major steps are proposed:

Step One : Specification of Post-Achievement Scores and their Accruing Decisions for Future Training / Employment.

The measurement of achievement is accomplished by one or more appropriate techniques presented above. Regardless of these techniques, however, tests or tools which are often used in the evaluation of achievement, fall within two categories: norm - referenced measures which compare the achievement of the trainee with another or with that of a hemogenious group.

The shortcoming of this approach stems from the fact that there will be no warrant for the trainee to successfully accomplish his professional tasks in reality. Why ? Because the normative ability which serves as a judgemental standard could be high or low, sufficient or insufficient for performing the actual job. Hence, the trainee may or may not be capable of carrying out the expected work responsibilities.

Contrary to the relative measures above, absolute-referenced tests produce more guaranteed results. The trainee, for example, who is prepared to be a plane pilot and is judged professionally by absolute behavioral standards, is generally considered a safe flyer; while it is doubtful that his peer, who is certified by relative or norm referenced measures, is seen to be that way.

Regardless of the nature of absolute and relative measures, final achievement scores are jotted on form (25). The pre-training scores are also taken and recorded in their specified categories.

As form (25) shows, it is comprised of several columns: serial numbers of job acts or terminal behavioral objectives, then the statements of objectives or acts. The third and fourth contain pre and post-training scores.The fifth represents the final results of achievement in terms of grades, pass / fail, or other evaluative terms.

The last column concerns itself with training employment decisions and activities, based of course on the quality of achievement scores in the previous columns. The decisions and activities are of two types: in the case of achievement and in the case of non achievement. Examples of each are as follow:

In the case of achievement

Training / employment decisions and activities could be :

1. Trainees graduated with grades.
2. Trainees advanced to another training level.
3. Trainees promoted to higher job or responsibility.
4. Trainees assigned to new job or responsibility.
5. Trainees rewarded with new benefits, statutes or positions .
6. Trainees permitted to work conditionally on the premise of making up deficient skills within specific future period.

In case of non-achievement

Training / employment decisions and activities could be :

1. Trainees dropped from program.
2. Trainees transfered to clinical training sessions for overcoming achievement difficiencies.
3. Trainees repeating the whole training program.
4. Trainees repeating specific segments of the training program.
5. Trainees to relinquish partly or in full the cost of training from their salaries.
6. Trainees blocked from promotion until further notice.
7. Trainees demoted to apropriate lower level or rank.
8. Trainees transfered internally to another job within their organizations.
9. Trainees transfered to another location or regional branch of the organization.
10. Trainees terminated temporarily from job until they achieve the required skills.

Form (25a): Designing summative evaluation of trainees' achievements & accruing decisions for future training / employment with norm - referenced measures: a prelude to program's cost - benefit analysis.

Employee: ..... The designer: .....
The job: Car driving. ..... Administration: .....
The task: Car maintenance. ..... Date: .....

Serial No.s	Terminal behavioral objectives (or job acts)**	Pre-training* scores	Post-training scores	Final results	Training - employment decisions & activities	
					In case of achievement	In case of non-achievement
1	Maintaining battery water to required level.	0/4	4/4	A	1. The trainee is certified to carry out maintenance responsibilities. 2. The trainee may upgrade his skills in objectives No.s: 2, 4, 7, 9, and 10.	
2	Maintaining radiator water to required level.	0/4	3/4	C		
3	Maintaining engine oil to required level.	0/4	4/4	A		
4	Maintaining wheel oil to required level.	0/4	3.5/4	B		
5	Controlling engine temperature to required level.	1/4	4/4	A		
6	Keeping car lights working properly.	1/4	4/4	A		
7	Keeping car brakes working effectively.	0/4	3/4	C		
8	Changing flat car tire.	1/4	4/4	A		
9	Keeping car locks working properly.	1/4	3.5/4	B		
10	Maintaining cleanliness of car.	1/4	3/4	C		
		Means	Totals	Pass	Grand results	
		0.12	$\frac{5}{40}$			
		0.9	$\frac{36}{40}$			

Notes **Illustrative example from form (11).
* Achievement data is hypothesized for illustration.

Form (25b): Designing summative evaluation of trainees' achievements & accruing decisions for training/employment with criterion - referenced measures: a prelude to program's cost - benefit analysis.

Employee: ..... The designer: .....
The job: ..... Administration: .....
The task: ..... Date: .....

Serial Nos	Terminal behavioral objectives (or job acts)**	Pre-training* scores	Post-training scores	Final results	Training - employment decisions & activities	
					In case of achievement	In case of non-achievement
1	Maintaining battery water to required level.	0/4	4/4	Pass		1. The trainee should repeat training on objectives: 2, 7, and 10. 2. The trainee will be tested in all three maintenance skills embeded in above objectives. 3. Formal certification to practice car maintenance is held until mastery of above skills is approved.
2	Maintaining radiator water to required level.	0/4	3/4	Fail		
3	Maintaining engine oil to required level.	0/4	3.5/4	Pass		
4	Maintaining wheel oil to required level.	0/4	4/4	Pass		
5	Controlling engine temperature to required level.	1/4	4/4	Pass		
6	Keeping car lights working properly.	1/4	4/4	Pass		
7	Keeping car brakes working properly.	1/4	4/4	Pass		
8	Changing flat car tire.	0/4	3/4	Fail		
9	Keeping car locks working properly.	1/4	4/4	Pass		
10	Maintaining cleanliness of car.	1/4	3.5/4	Pass		
Notes	**Illustrative example from form (11). * Achievement data is hypothesized for illustration.	Totals		Means		Grand results
				Failed in 3 objectives		
				Fail		

11. Trainees terminated from job permanently.

Whatever the evaluative measures, which the designer may adopt (norm or absolute), he actually needs an independent form for each trainee in the program.

Form (25) could serve, beside the analysis of performance, as a condensed record of trainees' achievements and also as a tool for further analysis of training data in forms (26) and (27) which follow.

Form (25 a) and (25 b) exemplify directly the evaluative tasks which step one calls for, using normative data as in form (25 a), then the absolute as in form (25 b).

Step Two: Specification of Differences Between Observed and Criterion Achievement Data As the Beginning of Cost - Benefit Analysis.

We shall now turn to the actual work of cost / benefit analysis of achievement data. This main step involves five sub-ones presented in form (26 a) and (26 b), and are briefed below:

1. Writing all names of trainees (column 1 and 2 form 26).
2. Recording pre and post training scores (column 3 in form 26).
3. Finding for each trainee, the differences in points (in case of normative evaluation) or in standards (in case of absolute evaluation or evaluation by objectives) between pre-post-training scores (column 4 in form (26)).
4. Summing up the scoring data for all trainees in column 3 (Form 26), and point differences in column 4 (Form 26).
5. Finding the ratio of unachieved points (as in Form (26 a), of un - achieved objectives (as in Form (26 b).

Step Three: Assessment of program's financial losses

This step could be accomplished by calculating the percentage of the program's behavioral difficiency, then multiplying the value by the total expenses which the program incurred (refer form 26 a and b).

For finding the percentage of program behavioral difficiency, the un - achieved points or objectives are divided by their counterparts: the achieved ones. The pre - training achievements should of course be excluded first from the post-training achievements, in order to ob-

Form (26b): Assessment of program's financial losses based upon the differences between pre- & post- training achievements. The core of costs-benefits analysis (with absolute evaluation).

The job: Car driving. ..... The designer: .....
The task: Car maintenance. ..... Administration: .....

Serial No.s	Name of trainees	Achievement scores		Differences in points	Data calculations & summaries
		Pre-training	Post-training		
1		0/10	5/10	-5	1. Total of required objectives = 100 - 15 = 85. 2. Total of un-achieved objectives = 17. 3. Percentage of un-achieved objectives (17) to required ones (85) = 20%. 4. Percentage of program's behavioral deficiency = 20%. 5. Total financial loss of program = 20% x $5900.00 = $1180**. ** Notice: The difference of financial loss is a result of absolute & normative evaluations. This is due to in-adequate achievements of objectives which are disregarded according to absolute referenced measures.
2		0/10	7/10	-3	
3		1/10	9/10	-1	
4		0/10	10/10	0	
5		0/10	8/10	-2	
6		4/10	10/10	0	
7		2/10	9/10	-1	
8		3/10	9/10	-1	
9		0/10	6/10	-4	
10		5/10	10/10	0	
11					
12					
	* Achievement required by each trainee is (10) obgectives. For ten trainees, the total of objectives is 100.	15/100*	83/100*	- 17	Grand totals

143

134

133

142

Form (26a): Assessment of program's financial losses based upon the differences between pre- & post- achievements. The core of costs-benefits analysis (with normative evaluation).

The job: Car driving. ..... The designer: .....
The task: Car maintenance. ..... Administration: .....

Serial No.s	Name of trainees	Achievement scores		Differences in points	Data calculations & summaries
		Pre-training	Post-training		
1		5/40*	36/40	-4	1. Total of required training points = 400 - 114 = 286. 2. Total of difference points = 32. 3. Percentage of un-achieved points (32) to required ones (286) = 11%. 4. Percentage of programs behavioral deficiency = 11%. 5. Total financial loss of program = deficiency percentage x program's costs = 11% x $5900**. 00 = $649.00
2		8/40	38/40	-2	
3		16/40	37/40	-3	
4		10/40	40/40	0	
5		4/40	32/40	-8	
6		17/40	40/40	0	
7		12/40	35/40	-5	
8		15/40	36/40	-4	
9		6/40	34/40	-6	
10		21/40	40/40	0	
11					
12					
	* The higher achievement point of each objective is 4 (see form 8). For ten objectives the total is then 40 & for ten trainees will be (40 x 10 = 400).	114/400	396/400	- 32	Grand totals ** Hypothetical value

Form (26a): Assessment of program's financial losses based upon the differences between pre- & post- achievements. The core of costs-benefits analysis (with normative evaluation).

The job: Car driving. ..... The designer: .....
The task: Car maintenance. ..... Administration: .....

Serial No.s	Name of trainees	Achievement scores		Differences in points	Data calculations & summaries
		Pre-training	Post-training		
1		5/40*	36/40	-4	1. Total of required training points = 400 - 114 = 286. 2. Total of difference points = 32. 3. Percentage of un-achieved points (32) to required ones (286) = 11%. 4. Percentage of programs behavioral deficiency = 11%. 5. Total financial loss of program = deficiency percentage x program's costs = 11% x \$5900**. 00 = \$649.00
2		8/40	38/40	-2	
3		16/40	37/40	-3	
4		10/40	40/40	0	
5		4/40	32/40	-8	
6		17/40	40/40	0	
7		12/40	35/40	-5	
8		15/40	36/40	-4	
9		6/40	34/40	-6	
10		21/40	40/40	0	
11					
12					
	* The higher achievement point of each objective is 4 (see form 8). For ten objectives the total is then 40 & for ten trainees will be (40 x 10 = 400).	114/400	396/400	- 32	Grand totals ** Hypothetical value

Form (26b): Assessment of program's financial losses based upon the differences between pre- & post- training achievements. The core of costs-benefits analysis (with absolute evaluation).

The job: Car driving. ..... The designer: .....
The task: Car maintenance. ..... Administration: .....

Serial No.s	Name of trainees	Achievement scores		Differences in points	Data calculations & summaries
		Pre-training	Post-training		
1		0/10	5/10	-5	1. Total of required objectives = 100 - 15 = 85. 2. Total of un-achieved objectives = 17. 3. Percentage of un-achieved objectives (17) to required ones (85) = 20%. 4. Percentage of program's behavioral deficiency = 20%. 5. Total financial loss of program = 20% x $5900.00 = $1180**. ** Notice: The difference of financial loss is a result of absolute & normative evaluations. This is due to in-adequate achievements of objectives which are disregarded according to absolute referenced measures.
2		0/10	7/10	-3	
3		1/10	9/10	-1	
4		0/10	10/10	0	
5		0/10	8/10	-2	
6		4/10	10/10	0	
7		2/10	9/10	-1	
8		3/10	9/10	-1	
9		0/10	6/10	-4	
10		5/10	10/10	0	
11					
12					
	* Achievement required by each trainee is (10) obgectives. For ten trainees, the total of objectives is 100.	15/100*	83/100*	- 17	Grand totals

tain the exact value of program productivity and consequently, its true behavioral shortages and financial losses.

Forms (26 aandb) summarize the behavioral and digital processes involved in steps two and three above.

Step Four: Assessment of Program's Productivity by Comparing Expenses With Expected Professional Outcomes.

Programs cost money. Money in turn consumes too much of human mental, energy and time. Hence, when man spends money for an undertaking, he should get the returns which parallel the invested capital. Training efforts are not excluded of course from this economical rule. Programs, therefore, should generate the benefits which are expected from them; otherwise, their existence could never be justified.

While money, in itself, can not measure the worth of human development in personality, intellect or life skill, it is customary, for administrative and economic purposes to weigh the adequacy of programs' outcomes against their cost inputs.

The ultimate goal of cost - benefit analysis then is not determining as much the value of human behavior, rather, it aims at weighing programs' effects in order to upgrade or energize their operational capacities, whenever deemed necessary.

When assessing program's productivity based on the comparison of costs and outcomes, the designer may use any tool available to him. Form (27) is an example of what could be adopted to accomplish this evalutive task.

The form contains categories for training expenditure, number of trainees participating in the program, the expected professional outcomes, productivity decisions and additional notes.

Since expected professional outcomes and productivity decisions, represent the core of form (27), examples of these two categories are given in the form itself.

Form (27): Assessment of program's productivity by comparing expenses with expected professional outcomes.

The job: Car driving. ..... The designer: ....
The task: Car maintenance. ..... Administration: .....

Cost data*		Professional outcomes expected from trainees (illustrative examples)	Productivity decisions (illustrative example)
Grand total of training costs or expenditure	Primary costs $5900.00 + program's financial loss/ retraining costs = $1180.00 = $7080.00	1. Smooth car driving & riding at most times. 2. Reaching work and other destinations on time. 3. Saving human life by avoiding possible accidents which could result from bad maintenance or the lack of maintenance. 4. Saving extra repair costs which could result from bad maintenance or the lack thereof. These costs cover spare parts & repairs & covering/indirect expenses related to the ten professional maintenance acts. 5. Encouraging commercial businesses to hire graduates as drivers or maintenance workers. 6. Obtaining acceptable outward appearance, smell & tidiness of car as a result of maintaining positive attitudes & behaviors toward car.	As a results of the professional economic & social outcomes which the program proclaims, it is seen as very beneficial in productivity. Thus, it deserves the consideration of repeating it with other groups of trainees according to arising needs in the future.
Number of trainees	10		
Individual training cost	$708.00		

Notes:
* The evaluative procedure chosen is criterion referenced measure.
* Cost data is hypothetical for the purpose of illustration.

Evaluating Program's Validity and Deciding Upon it's Future

Exploring the program's validity is a more theoretical, arduous, and complex task than is the case of specifying effects. For determining program products, one may conduct an appropriate achievement or outcomes test and judge directly the adequacy of results. When judging validity however, the matter is different. It requires looking at several angles of training and many of the program's components, details, evaluative criteria, methods, and goals.

A sample of training factors which the evaluation of validity may consider, are:

1. The content of the curriculum.
2. The document.
3. The media, materials and technology.
4. The facilities.
5. The methods.
6. The human services.

Depending on the nature and rules of above training factors, different types of validity appear to be essential. Among many, some examples follow:

1. The constitutional validity which explores the qualifications of curricular elements (the goals, knowledge, and achievement activities) individually and as a whole, to form the training curriculum.
2. The educational validity which concentrates on probing the program's representational capacity of required professional skills.
3. The construct validity which examines the adequacy of the program's behavioral composition to embody the learnings of professional skills.
4. The psychological validity which explores the compatibility of training factors and processes to trainees' personal, attitudinal, cognitive or learning styles and characteristics.
5. The technical validity which concentrates on evaluating the production / physical aspects of educational and material services and the document of training .

Since training program is designed systematically from needs assessment to the evaluation of productivity according to the behavioral digital approach presented in this book, and, whenever the results of

training are considered quantitatively and qualitatively adequate, it becomes unnecessary, then, for evaluation specialists to bother very much with the validity question of training.

If the program's outcomes, on the otherhand, look low comparable to the achievement standards, the initiation of validity studies, appear to be imminent.

What Comes Next ?

With this chapter, the design cycle of training is complete. However, as a result of effect and validity evaluation presented briefly in the chapter, several training decisions for the future will arise. These are:

1. The approval of the training program as it is for future use with other groups of trainees; hence, the beginning of another training cycle.
2. The approval of the training program for future use after undergoing some revisions of its curricular, human, material, psychological or administrative factors; hence, the beginning of a dual designing/ training cycle.
3. Disregarding the training program due to its low validity of primary effects, or negative hybrid (side) effects on employees, organization or job; hence, the beginning of a new training design cycle.

REFERENCES

Chapter 1

1. **Abella, K.** Building Successful Training programs. Reading, Mass.: Addison - Wesley Publishing Co., 1989.

   Friedman, P. & Yarbrough,E. Training strategies from start to finish. Engle wood cliffs, N.J.: Prentice- Hall, Inc, 1985.

   Rogoff, R. The Training Wheel-A simple Model for Instructional Design. NeW York: John Wiley & soms, 1987.

2. Refer for example to:

   Edwards, I.E., Gadd, C.J. and Hammond, N.G. The Cambridge Ancient History. Vol. I, Part I & II. (Third Edition) Prolegomena & Prehistory. Cambidge: Cambridge University Press, 1976.

   Strayer, J. and others. The Main Stream of Civilization. New York: Harcourct Brace Jovanovich, Inc. 1974.

   International Commision For A History of the Scientific and Cultural Development of Mankind. History of Mankind (Prehistory and the Beginings of Civilization. Vols. I and II). Paris: Unisco, 1967.

3. **Steimetz**, C. The History of Training. In, Craig, R. (Edr.) Training and Development Handbook - A Guide To Human Resource Development. New York: McGraw - Hill Book Co., 1976, pp. 1 - 4.

4. **Miller, B**. The History of Training. In, Craig, R. (Edr.). Training and Deveolpment Handbook - A Guide to Human Resource Development New York: McGraw - Hill Book Co. 1987, pp. 1 - 8 .

5. **Miller**, 1987, pp. 1 - 14.

6. **Houston, R. & Pankratz, R. (Edrs.**) Staff Development & Educational change. Reston, Va.: ATE, 1980

7. Dillon - Peterson, B. Staff Development / Organization Development Perspective. In, Dillon - Peterson, E. (Chrn. & Edr.). Staff Development. / Organization Development. Alexandria, Va.: ASCD, 1981, pp. 1 - 10.

8. **Craig, R. (EDr.)**. Training & Development Handbook - A Guide to Human Resource Development, New York : McGraw - Hill Book Co., 1976 & 1987.

9. **Kerrigan, J. & Luke, J.S.** Management Training Strategies for Developing Countries. Boulder, Clo,: Lynne Rienner Publishers, 1987.

10. **Schaffer, B. (Edr.)**. Administrative Training and Development - A Comparative Study of East Afica, Zambia, Pakstan, and India. New York: Praeger Publishers, 1974.

11. Beside above references, the following were available to the Author:

    - **Baily**, C, The Measurement of Job Performance. Hampshire, Eng.: Gower Publishing Co. 1983.

    - **Bemis, S. & Others.** Job Analysis - An Effective management Tool. Washington, D.C: The Bureau of National Affairs, Inc. 1983.

    - **Gael, S. Job Analysis:** A Guide to Assessing Work Activities. San Francisco, CA: Jossey - Bass, 1983.

    - **Garry, W. and others (Edrs.)**. A Checklist for Technical Skills and Other Training. Madison, Wn.: Technical & Skills Training Division, ASTD, No date.

    - **Goldstein, I. Training:** Program Development & Evaluation. Montery, CA.: Brooks/ Cole Publishing Co., 1974.

    - **ILO.** An Introductory Course in Teaching & Training Methods For Managment Development. Geneva: International Labor Office, 1981.

    - **Kearsley, G. Training & Technology** - A Hanbook for HRD Professionals. Reading, Mass.: Addison Wesley Publishing Co., 1984.

    - **Kozoll, C.** Staff Development In Organization - A Cost Evaluation Manual For Managers & Trainers. Reading, Mass.: Addison-Wesley Publishing Co., 1974.

    - **Odiorne, G.** Training by Objectives - An Economic Approach to Management Training. London: Collier - MacMillan Ltd., 1970.

    - **Pepper, A.** Managing the Training & Development Function. Hants, Eng.: Gower Publishing Co. 1984.

    - **Rae, L.** The Skills of Training - A Guide for Managers & Practioners. Hants, Eng.: Gower Publishing Co., 1983.

    - **Ribler, R.** Training Development Guide. Reston, Va.: Reston Publishing Co., 1983.

- **Sauer, S. and Holland, R.** Planning In - House Training - A Personal System with an Organizational Perspective. Austin, TX.: Learning Concepts,. 1981.

- **Stanley, L. (Edr.)** Guide to Evaluation of Training. ICPE Training Series, No. 2. Titova, Ya.: ICPE, 1984.

- **Turrell, M.** Training Anaylsis - A Guide To Recognization Training Needs. Plymouth, England: Macdonald & Evans, Ltd., 1980.

- **Wexley, K. and Latham, G.** Developing & Training Human Resources In Organization. Dallas: Scott, Foresman & Co., 1981.

- **Zawacki, R. and Warrick, D.** Organization Development: Managing Change in the Public Sector. Chicago: International Personnel Management Association, 1976.

Chapter II

1. **Partly** from: Davis, R., **Alexander, L., and Yelon**, S. Learning System Design - An Approach To The Improvement of Instruction. New York: NcGraw-Hill Book Co. 1974, pp. 144 - 145; And **Gagné**, R. The Conditions of Learnign. New York: Holt, Rinehart and Winston, 1978, pp.197, 264.
2. **Generally from**: Davis & Others, 1974, pp. 153.
3. **Sackman, H.** Delphi Critique Lexington: Lexington Boooks, 1975.
4. **Adapted** from: **Pepper**, 1984; and **Turrell**, 1980, pp. 20 - 25.
5. **Bloom, B.** etal. Taxonony of Educational Objectives. Handbook I: Cognitive Domain. New York: David McKay Co., 1974.

Derr, R. A Taxonomy of School Purposes of Public Schools. New York: David McKay Co., 1973.

Gagne, The Conditions of Learning. New York: Holt, Rinehart and Winston, 1977.

Harrow, A. A Taxonomy of the Psychomotor Domain. New York: Longman, Inc., 1972.

Krathwohl, D., Bloom, B., and Massia, B. Taxonomy of Educational Objectives. Handbook II: Affective Domain. New York: David McKay 1974.

Chapter V

1. Refer for example to: **Friedman & Yarbrough**, 1985, pp. 174-180; **ILO**, 1981, pp. 2-5; and **Sauer & Holland**, 1981, p. 93.

Cahpter VI

1. **ILO**, op cit, 1981.
2. **Hamdan, M.Z. Educational Media and Technologies** - Concepts & Practices in Learning & Teaching. Amman. Jordan: Modern Education Hose, 1986 (In Arabic) .
3. Adapted generally from : **Friedman & Yarbrough**, 1985, pp. 193-197.
4. Adapted from: **Odrione**, 1970; and **Wexley & Latham**, 1981, pp. 208 - 209.

Chapter VIII

1. Adapted partly from: **Marsh, N.** Training Records & Information Systems. In, raig (Edr.) , 1976, pp. 3,30 - 32.

Chapter IX

1. Generaly from: **Rae**. 1984, pp. 86 - 124; **Parker**, 1976; and **Stanley**, 1984, pp. 35 - 43.
2. Adapted partly from: **Wexley & Latham**. 1981, pp. 79 - 80.

Index