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## DESIGN OF TRAINING PROGRAMS: EFFECTIVENESS

Countries and organizations invest substantial sums in the further education and training of their workforce. This investment in human resources is motivated by a desire to develop the required level of competence in the organization. In return on this investment, organizations of course want successful training programs -- programs that enhance the competence of workers and that contribute to attaining the general goals of the organization. But what are the factors that contribute to the success of training programs?

Determinants of successful training programs are discussed in this entry. Several models for the design of training programs are described, and the functionality of such models for establishing successful programs is stressed. Approaches to and questions for effectiveness evaluation are presented, and transfer studies as well as management activities that can enhance the transfer of training are reviewed.

## **1. Definition**

Nadler (1984, 1.16) distinguishes training, education and development as activities of human resource development. Training is aimed at creating learning processes that are relevant for the present job, education for a different but identified job, and development for growth of the individual, but not related to a specific present of different job, thus enhancing the flexibility of the individual and the organization. An important additional difference between training and development consists of the intentionality of the training intervention. Training is preplanned and goal oriented, whereas development may be incidental. In this entry training is defined as the provision that is aimed at creating intentional learning processes that contribute to improving the performance of workers in their present job (Mulder, 1992).

## **2. Systems Design Models**

Training is often conceptualized as a systems design model. Such models represent important components of the preparation stage of the training process, training delivery, and post training activities. Andrews and Goodson (1980) describe about 40 systems design models that were developed during the 1960s and 1970s. They conclude that there is wide variety in the scientific basis, the context of application, and the documentation of these models, but that the major components of the systems design models are identical, and that the systems philosophy in

training design is well proliferated. The common elements in the models can be summarized as the input, process, output and context elements.

An important systems design model is developed by Romiszowski (1981). This model is characterized by three design dimensions: (a) the stage in the systems approach, (b) the design level, and (c) the kind of activity that is performed in the design project. There are moreover five design stages: problem definition, problem analysis, design or development of a solution, implementation, and control or evaluation. The following design levels are distinguished: (a) the course level, (b) the module level, (c) the lesson plan level, and (d) the activity level. The kind of activities are: (a) analysis activities, (b) synthesis activities, and (c) evaluation activities. A further characteristic is that the design activities relate to one-another in a non-linear fashion. Figure 1 shows this non-linearity in instructional design, and can be conceived of as a representation of the instructional design nucleus at all design levels. The main stages of instructional design are positioned in the outer shell, whereas the character of the instructional design activities are placed in the center.

The tools that are described in the work of Romiszowski are interpreted as heuristics, since in most cases there is no single right answer to performance problems in organizations. Training program designers can therefore only create the best solutions in the given circumstances. The assumption is that employing training design models enhances the fit of the solution to the performance problem encountered.

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Figure 1 About Here  
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During the first stages of the training design project the designer should answer the question whether training is the solution to a given problem. The designer must analyse the performance problem thoroughly because such problems are not only caused by skill insufficiencies but also by, for example, problems of incentive, motivation, organization, ergonomics and safety. The first question the designer should answer is whether a prospective trainee lacks the necessary knowledge, skills and attitudes. The next question is whether the knowledge, skills and attitudes can be systematically taught. If there are other causes of the performance problem, the training designer may propose (or be invited to participate in) an interdepartmental project, of which training is part of the solution.

### **3. The Human Resource Results Model**

In a comprehensive study of the American Society for Training and Development various areas that are related to training are distinguished in a so-called Human Resource Wheel (McLagan and Suhadolnik 1989). The basis of this Human Resource Results model is that Human Resource (HR) related systems and

interventions are distinguished on the one hand, and Human Resource outputs on the other (see Fig. 2).

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Figure 2 About Here  
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I. It can be seen from Figure 2 that HR related systems and interventions consist of three components: HR Environment, HR Development, and HR Support.

Human Resource Development consists of:

- (a) Training and development: identifying, assuring, and -- through planned learning -- helping in developing the key competencies that enable individuals to perform current or future jobs;
- (b) Organization development: assuring effective inter- and intra-unit relationships and helping groups in initiating and managing change;
- (c) Career development: assuring an alignment of individual career planning and organization career-management processes in order to achieve an optimal match of individual and organization needs;

Human Resource Environment consists of:

- (a) Organization/job design: defining how tasks, authority, and systems will be organized and integrated across organizational units and in individual jobs;

- (b) Human resource planning: determining the organization's major human resource needs, strategies and philosophies;
- (c) Performance management systems: assuring that the goals of individuals and the organization are aligned and that the goals of the organization are supported by the tasks the individuals perform at work;
- (d) Selection and staffing: matching people and their career needs and capabilities with jobs and career paths.

Human Resource Support consists of:

- (a) Compensation/benefits: assuring fairness and consistency in the provision of compensation and benefits;
- (b) Employee assistance: providing personal problem solving assistance and counseling to individual employees;
- (c) Labor relations: assuring good relationships between the labour unions and the organization;
- (d) Research and information systems: assuring the development and operation of a human resource information base.

II. All these Human Resource areas should result in the following

Human Resource Outputs:

- (a) Enhanced productivity;
- (b) Quality;
- (c) Innovation;
- (d) HR fulfillment;
- (e) Readiness for change.

If these outputs are the main criteria for successful performance in organizations, then training programs should contribute to these criteria. This philosophy is often referred to as the training-as-a-tool-of-management philosophy.

#### **4. Approaches to Training Evaluation**

Training can be conceptualized at different levels in the organization. Romiszowski (1981) distinguishes between the macro level and the micro level. The macro level is the level of the organization. At that level performance problems are analyzed and solutions defined. Criteria for success are those human resource results that are distinguished by McLagan and Suhadolnik (1989). The micro level is the training design level, which consists of the design stages described above. Achievement is the principal success criterion at that level: increased knowledge, skills or attitudes.

The outcomes of the problem analysis stage at the macro level serves as the input into the needs analysis at the micro level. The output of the micro level (increased knowledge, skills and attitudes) serves as input for the implementation stage of the training outcomes at the macro level. The meso level and the supra level can be added to the macro and micro level. The meso level is the level of the training department within the organization, and the supra level is the business environment. Outputs of these levels can also contribute to variation in performance criteria such as productivity, quality, and innovation.

Hinrichs (1976) relates the concept of the supra-system to the system of interest: the individual trainee, the training department, and executive management. For the individual trainee the training department is the supra-system. Formal achievements of the individual trainee are learning and altered behavior. Trainees' needs are satisfied by the personal growth of individuals and the sense of increased competence. For the training department executive management is the supra-system. Formal achievements of the training department are the determination of specific training needs, program design and implementation and identification of the individuals to be trained. The training department's needs are satisfied by recognition of successful programs and objectives achieved, and by continuing demand for training programs. For the executive management the business society is the supra-system. Formal achievements of executive management with respect to training are the setting of policy and the objectives for training, and the allocation of resources to training vis-à-vis other strategies. Executive management's needs are satisfied by organizational success in meeting the overall objectives.

### **5. Questions for Training Evaluation**

Training results can be categorized at each of the systems levels identified above. Beyond the evaluation of training system characteristics, Brinkerhoff (1987, 16) distinguishes between three categories of questions for training effectiveness evaluation



in relation to the human resource development decision cycle, which in fact should be analyzed at different systems levels:

(a) The trainees exit with new knowledge, skills and attitudes; sufficient human resource development has taken place. In this case relevant questions are:

Who has not acquired the specified knowledge, skills and attitudes?

What else was learned?

Are the acquired knowledge, skills and attitudes sufficient for effective on-the-job usage?

(b) The trainees use newly acquired knowledge, skills and attitudes on the job or in personal life; reactions to human resource development are sustained. Possible questions are:

Have the training effects lasted?

Who is using the new knowledge, skills and attitudes?

Which skills and attitudes are being used and which are not?

How are the skills and attitudes being used?

How well are the skills and attitudes being used?

(c) The usage of the newly acquired knowledge, skills and attitudes benefits the organization; original human resource development needs are sufficiently diminished. Relevant questions are:

What benefits are occurring?

What benefits are not occurring?

Are any problems occurring because of the use or non-use of new knowledge, skills and attitudes?

Should human resource development be continued?

Should less be done, or more?

Are revisions needed?

Was it worth it?

Questions whether any learning took place can be answered at the micro or individual trainee level. Questions whether the trainees use new knowledge, skills and attitudes can be analyzed at the macro or the (executive) management level, or at the level of job performance. In the process of answering these questions supervisors' perceptions of the trainee are at stake. The evaluator should contact management in an early stage of the training design process to establish the commitment of the management to evaluation. Questions with respect to the effects of training at the organizational level should also be analyzed at the macro or (executive) management level. However, questions concerning the organizational impact of training are not easy to answer. Management has several human resource strategies at its disposal, as described earlier, and the effects of different strategies will interact. Because of this complexity, little is known about the direct and indirect effects of human resource interventions.

## **6. Learning Results and Transfer**

The success of training programs can be assessed at both the micro level and the macro level. At the micro level learning results are the main objective of the training effort, whereas at the macro

level performance change is the ultimate objective. The transfer of training facilitates performance change.

Previous research has contributed to an understanding of success and failure factors in training design. Useful reviews of previous studies are presented by Campbell (1971), Goldstein (1980) and Wexley (1984). Campbell reviews 213 publications in the training field on a wide variety of topics. He concludes: "In sum, we know a few things but not very much" (op. cit., 593). Goldstein (1980) analyses more than 250 studies on various training issues. He presents a more optimistic conclusion than Campbell, and contends that whereas "... the vast majority of writing in this area is not empirical, theoretical, or thoughtful, there is a small but increasingly significant literature that focuses on important issues and raises the expectations of this reviewer about future possibilities" (op. cit., 262). Wexley (1984) discusses the results of about 150 empirical and theoretical studies on the outcomes of training programs. He finds that the fit of training programs to the trainees and their jobs is a major success criterion. Some studies also show that specific interventions resulted in training time reduction. This is an important finding, as the cost of training is to a large extent determined by the cost to the organization of a reduction in the trainees' worktime (see *\*Measurement of Training Costs*). On the basis of the above reviews it can be concluded that the results of studies tend to be contingent upon particular situations and circumstances, for example with respect to the branch and type of organization in which the training activity took place.

Baldwin and Ford (1988) analyze 70 studies of training transfer. The authors propose a conceptual model that consists of training inputs, training outputs and conditions for transfer. Training inputs are divided into three clusters of variables: (a) trainee characteristics, such as ability, personality, and motivation; (b) training design, for example in relation to principles of learning, sequencing, and training content; (c) work environment, such as support and opportunity to use training results. The hypotheses are, first, that training design, trainee characteristics, and work environment directly influence learning and retention, and second, that learning and retention, trainee characteristics, and the work environment influence generalization and maintenance of the learning results.

Baldwin and Ford (1988) conclude that some studies show that improved training design results in improved transfer. Correspondence between training elements and the work setting, the teaching of general principles instead of specifics, stimulus variability, and specific conditions for practicing learning tasks are some of the factors that appear to enhance transfer. But the results also indicate that the outcomes of training are contingent upon training task and training recipient. The studies on trainee characteristics show conflicting results. In some studies relationships are found between trainee selection and the prediction of trainability, but in other studies this is not the case. Several studies report significant effects of motivational factors on transfer. The number of empirical studies on the relationships between characteristics of the work environment and transfer is

limited. However, one research study shows that pre-training discussion with supervisors and subsequent supervisors' sponsorship contributes most to successful skills transfer.

## **7. Conclusion**

General answers to the question as to what are the determinants of successful training programs cannot be given. Theoretically one can expect that trainer characteristics, trainee characteristics, training program characteristics, and management characteristics are important determinants. The International Board of Standards for Training, Performance and Instruction has published four reports that list the kind of competencies training managers, trainers, and instructional designers should have acquired in order to manage, design, develop, implement and evaluate training programs. Broad (1982) mentions a long list of management activities that support training transfer. Particularly important are management involvement in pre-training decisions, support during the training activity, job linkage for pre-entry into the work situation, active stimulation of application of learning results, and follow-up. As the research basis of training design is generally weak, training practice rests in the main on conceptual training models.

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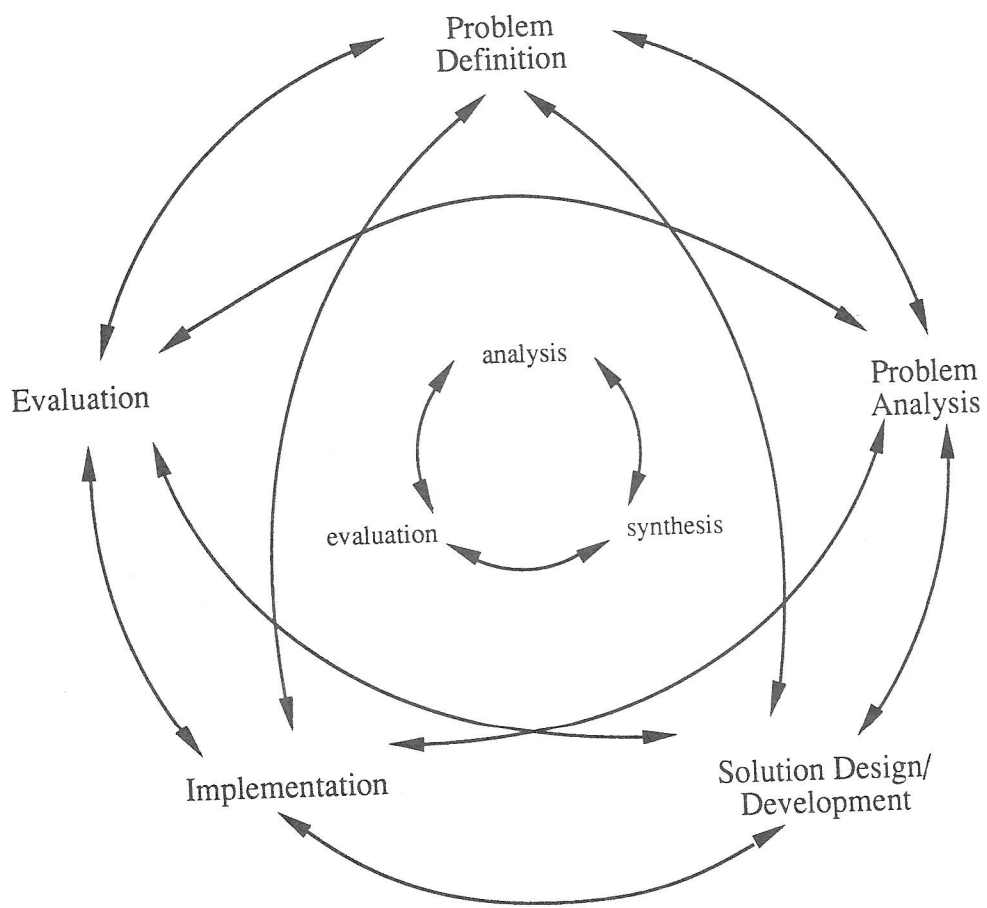
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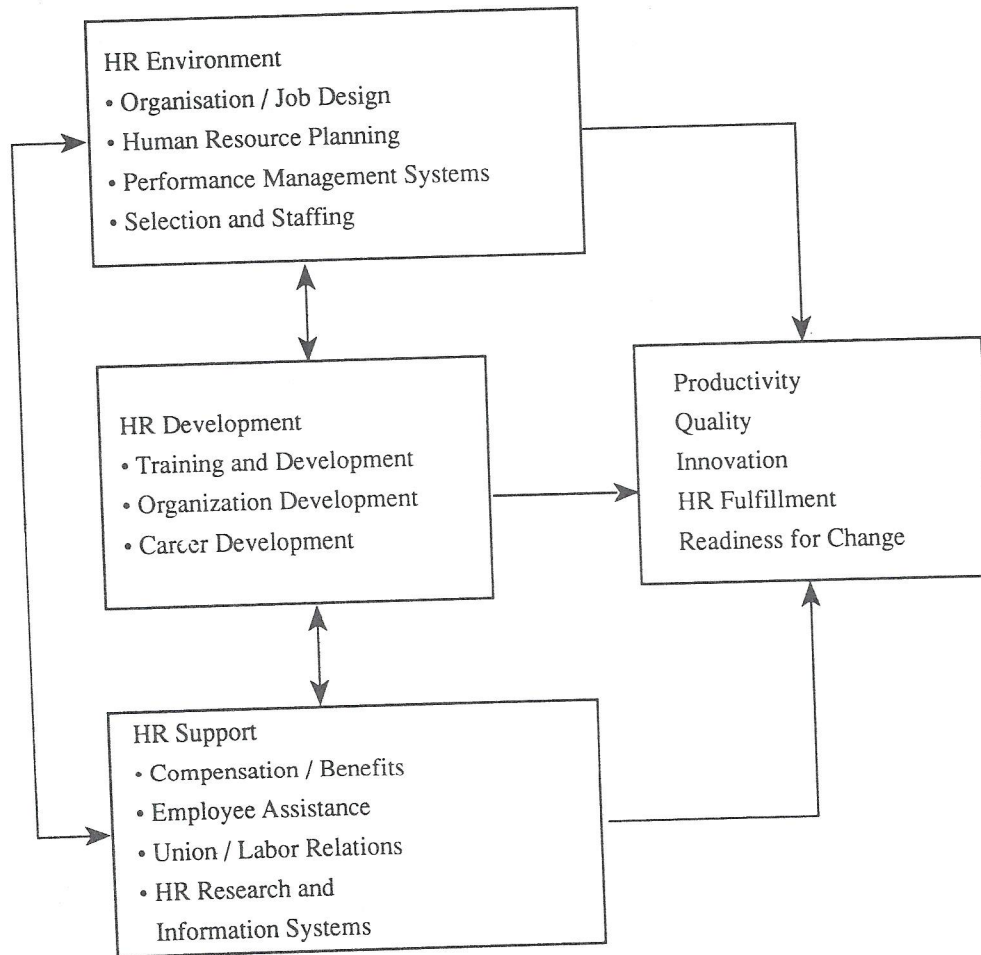




**Fig. 1** The Instructional Design Nucleus at all System Levels

**HR Related Systems  
and Interventions**

**HR Outputs**



**Fig. 2 Human Resource Results Model**