TOWARDS DESIGN STANDARDS FOR CURRICULUM CONSISTENCY IN CORPORATE EDUCATION

Joseph Kessels

TOWARDS

DESIGN STANDARDS

FOR

CURRICULUM CONSISTENCY

IN

CORPORATE EDUCATION

Joseph Kessels

CIP-GEGEVENS KONINKLIJKE BIBLIOTHEEK, DEN HAAG

Kessels, Joseph. W.M.

Towards design standards for curriculum consistency
in corporate education / Joseph Willem Marie Kessels. -
[S.l.: s.n.]. - Ill., fig., tab.
Proefschrift Enschede, 1993.
- Met lit. opg. - Met samenvatting in het Nederlands
ISBN 90-9006628-4
Trefw.: leerplanontwikkeling

2de druk 1994

TOWARDS DESIGN STANDARDS FOR CURRICULUM CONSISTENCY IN CORPORATE EDUCATION

PROEFSCHRIFT

ter verkrijging van
de graad van doctor aan de Universiteit Twente
op gezag van rector magnificus
prof.dr. Th.J.A.Popma
volgens besluit van het College voor Promoties
in het openbaar te verdedigen
op donderdag 9 december 1993 te 16.45 uur

door

Joseph Willem Marie Kessels

geboren op 19 augustus 1952 te Echt

Het proefschrift is goedgekeurd door de promotor:

prof. dr. Tj. Plomp

PREFACE

> *'The technique of curriculum-making along scientific lines has been but little developed. The controlling purposes of education have not sufficiently particularized. We have aimed at a vague culture, an ill-defined discipline, a nebulous harmonious development of the individual, an indefinite moral character-building, an unparticularized social efficiency, or, often enough nothing more than escape from a life of work.'*
>
> Franklin Bobbitt, *The Curriculum* (1918, p. 41).

The first thing a friend pointed out to me when reading a draft version of this page was the misprint of the year of publication of the quotation above. Not aware of some historical interest on my part, he thought he had come across a typical word-processing error and that I had typed 18 instead of 81.

When reading the reprint of this 75 year old foundation of curriculum technology, I was struck by its relevance to our time. As a consultant, I have been engaged in many curriculum projects over the past twenty years. A large part of these suffered from one or more of Bobbitt's problems, and even in those that did not, clients still found it hard to tap the invaluable opportunities learning could offer to their organization.

This study offered me a period of reflection on my practical work, as it forced me to make inquiries into the underlying principles of building relevant learning environments.

Many colleagues and organizations have contributed to the work I have been able to do during the past five years. I am deeply grateful to the large number of companies, training managers, investigators, analysts, developers, and assessors, who took part in the two research projects. Their contribution was not only a precondition for the empirical part of this study, but also reinforced the mutual interest in corporate education of both the practical and the academic world. Their full names are listed in the acknowledgement section to follow.

I want to thank my tutors Kathy Keohane and Lee Katya Mitzman, who taught me patiently how to write and speak standard English.

I am very grateful to Karel Stokking, who guided me through the field of methodology. He is held in my highest esteem, as he helped me in identifying crucial constructs, building a chain of reasoning, and analysing and interpreting the data. His critical reflections on my work had an important influence on my attitude towards scientific research.

To my promoter Tjeerd Plomp: in his approach to my research he combined rational pragmatism and devoted dedication. It was a privilege to work with him on the development and elaboration of the curriculum consistency theory. I could not have asked for more inspiration and stimulation for my efforts. In moments of despair, I went on for him.

I also wish to express my love and gratitude to a few special friends. Henri Methorst: an inexhaustible source of energy who encouraged me to start, to go on and to achieve. Cora Smit: for seventeen years my faithful and highly professional associate in the field of corporate education. Reflecting on our work we developed many of the ideas and concepts that are presented and discussed in this volume. I feel deeply obliged to Cora and Henny Leuven for arranging my sabbatical leave to complete this study. I pay tribute to Herman Gordijn, my loyal companion in my private life. Though aware of my physical presence, for more than six months he was not quite sure whether the zombie would ever share a social life again.

Joseph Kessels

Terschuur, September, 1993

ACKNOWLEDGEMENTS

Many persons and institutions have contributed to the two research projects. Without their help none of the activities in the empirical part of this study would have been possible. I want to thank them all:

Human resource managers and investigators of the case studies:
Henk Arts, Theo Brekelmans, Jantien Fennema, Noud Maas, Bert Nijenhuis, Marion Noordzij, Cor Roozemond, Wil van Roy, Eelco de Ruiter, Cor de Rijcke, Wil van Son, Peter Vriend, Jos van der Waals and Hans Westenbroek.

Data analysts of the case studies:
Miriam Dekker, Hanneke Dorenbosch, Kerstin Kiesling, Ellen Kneefel, Ellen Krabben, Annet Scholten and Gerda Wolf.

Assessors of the effects of the case studies:
45 participants in the NVvO workshop on curriculum design.
(NVvO - Dutch Training and Development Association)

Curriculum developers of the 28 projects:
Bas Andriessen, Jack van den Berg, Peter Boshuizen, Marieke van Dam, Marie-Josée Engwegen, Cees Franken, Carla de Greef, Annemie Hanssen, Netty van Heezik, Hans Hommel, Elly Honings-van Wissen, Heleen Kolijn, Ronald Lesuis, Josti Meijers, Jeroen Ouendag, Anjo Petit, Wout Raadgers, Douwe Rop, Gert Runhaar, Ineke Schrijver, Ria Schreurs-Mooren, Mario Simmon, Leonore Stollwerk-van der Veen, Arie Terpstra, Fons Terwisscha van Scheltinga, Erik Vos, Arjen de Vries, Els van Weering.

Programme director and guest lecturers of the course for developers:
Cora Smit, Govert van den Aerdweg, Monica Armour, Frans van Haarlem, Burg de Rave, Alexander Romiszowski, Klaas Schaafsma, John Schuijt, Robert-Jan Simons, and 30 mentors for the participants.

The training course for curriculum developers was carried out under the auspices of the Board of Governors and the Board of Trustees of the Foundation for Corporate Education. I would like to thank the board members who stimulated the development and implementation of the programme.

Assessors of the curriculum projects:
Gerard Bergenhenegouwen, Frans de Bruijn, Leo Dercksen, Gejo Duinkerken, Ans Grotendorst, Rob Halkes, Jan de Jong, Paul Keursten, Piet Koehorst, Erik Koenen, Theo Lamers, Johan Luchters, Yvonne Luijken, Marcia Lindeboom, Bas Rosendaal, Cora Smit, Robert-Jan Simons, Ton Stassen, Jan Thijs, Harm Tillema, Rob Veersma, Bert Versloot, Jos Vreeswijk, and Peter Vriend.

Organizations that participated in the case studies and projects:
Gemeente Politie Rotterdam, F. Van Lanschot Bankiers, KPMG Management Consultants, ING Postbank, Centrum voor Kantoor Innovatie, Hoogovens Buizen, N.V. Nederlandse Spoorwegen, De Nederlandse Bank, Interpolis, OCE Nederland, ITT-Publimedia, GAK-Gemeenschappelijk Administratiekantoor, Rabobank Nederland, Van Gend & Loos, Madido, Rijks Computer Centrum, STOAS, RINO Noord-Holland, Algemeen Burgerlijk Pensioenfonds, RVS-Verzekeringen, Ziekenhuis Eemland, American Express (several of these organizations participated in both case studies and projects).

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION AND SUMMARY

The aim of this study is to develop a set of practical design standards that can be used in the context of corporate education. Economic, social and cultural turbulence in society result in a continuous need to adapt to an ever-changing environment. Learning is considered a major vehicle for organizations to implement the necessary structural, technological and cultural transformations that are needed in order to grow, or at least to survive (Argyris, 1990; Argyris & Schön, 1974, 1978; Carnevale, 1991, 1992; Nadler, 1980; Nadler & Nadler, 1989, 1992; Nadler & Wiggs, 1989; Senge, 1990; Storey, 1992).

Although the importance of learning rarely has been questioned, there is increasing doubt as to the effects of the actual activities geared towards the facilitation of learning processes. Training and development activities absorb a costly part of an organization's manpower capacity, budget and opportunities, but the resources needed become scarce in periods of economic decline (Harrison, 1992). In organizations, the need for successful adaptation, and thus also for learning, is most urgent in such periods of economic instability. At present, learning is widely recognized as a major vehicle for survival and change, and great interest is shown in emerging and re-emerging concepts such as 'learning to learn', 'organizational learning' and the 'learning company' (Pedler, Burgoygne & Boydell, 1991; Senge, 1990; Swieringa & Wierdsma, 1989).

Curriculum Design

Curriculum design plays an important role in creating an educational environment that fulfils the needs for learning. Descriptive theories on how learning is organized are available, but prescriptive theories and their related design instructions are scarce (Nijhof, 1993a; Reigeluth, 1983; Thijssen, 1988).

This study partially fulfils this need and offers a theoretical and an empirical basis for design standards that should lead towards goal oriented and cost effective learning situations. These learning situations are not restricted to the typical classroom environment. In principle an organization offers a wide variety of learning opportunities. Most of all,

this environment outside the classroom seems to play such a dominant role in achieving the desired effects of intentionally organized learning situations (Broad & Newstom, 1992; Kirkpatrick, 1975; Den Ouden, 1992; Robinson & Robinson, 1989; Simons, 1992; Van der Vegt, 1974).

Design standards for corporate education focus primarily on the acquisition of skills that are sustained by the work environment; skills that should bring about intended changes in employee performance and an impact on the organization. The body of knowledge on public education provides the broad theoretical foundation for such design standards. Moreover, the complex mechanisms in corporate education, where cognitive operations of individual learning intertwine with social processes of an organizational context, demand an extended theory that seeks to explain the existing successes and failures of training systems and predicts the results of new actions. However, such a study should avoid the immodesty of presenting a grand theory that pretends to solve all problems in the field. Nor can it inquire in depth into trainer behaviour and trainee background variables as age, gender, intelligence, culture, and previous education.

Corporate education provides intentionally designed learning situations aiming at the mutual effects of individual and organizational behaviour. Therefore, the curriculum design theory needed should not only incorporate indicators for the development of curriculum materials, but also prescribe approaches that relate to the strategic issues of an organization, to structural feedback mechanisms, as well as to the design of a work environment that inherently holds constructive educational values.

Research Questions.

Thus, the aim of this study is to develop a prescriptive theory and validated design standards for corporate education, and as such addresses the following research questions:

1. Which factors in curriculum design influence quality in corporate education?
2. How do these factors operate?
3. Can design standards control these factors?

To answer these questions, research involved becoming engaged in an endeavour that encompassed the components summarized in Figure 1-1.

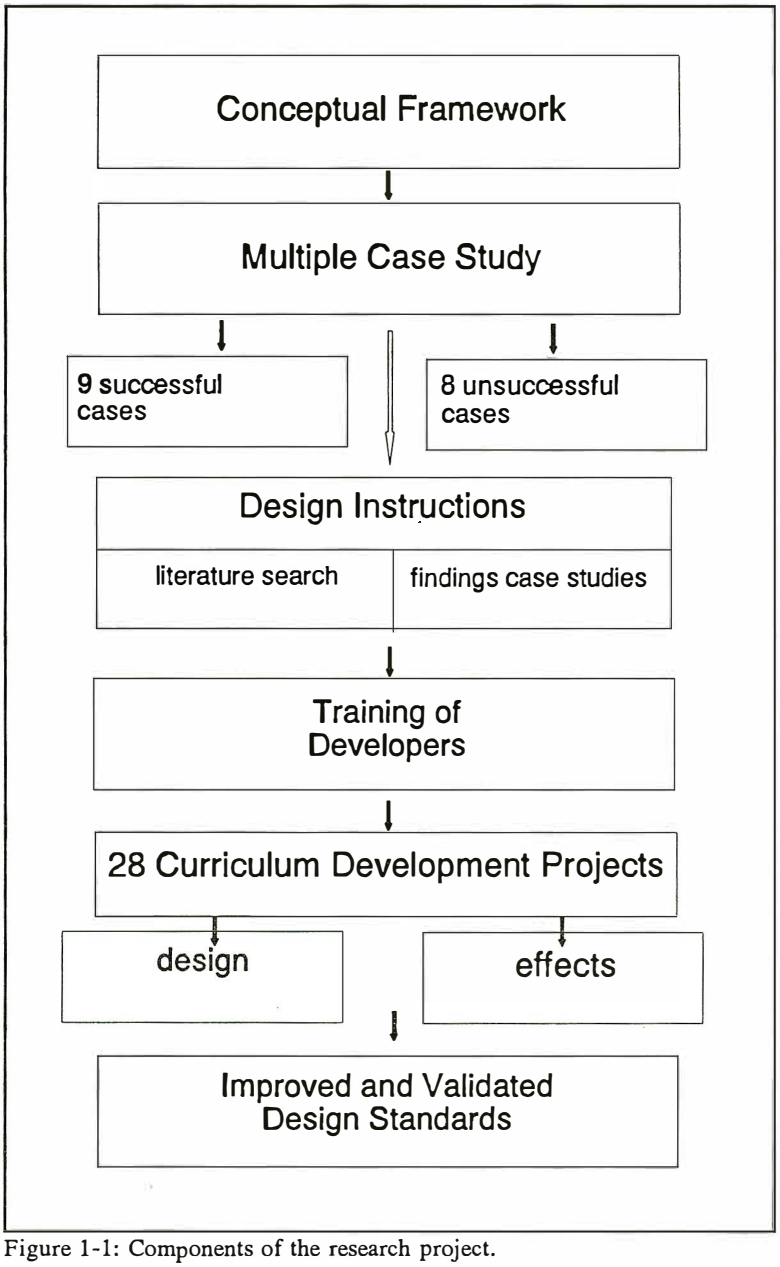


Figure 1-1: Components of the research project.

Curriculum Typology

The main concept of the theory presented in this study is the concept of curriculum consistency. Taba (1962, p. 76) described the term curriculum as:

> '... essentially a plan for learning. Consisting as it does of goals for learning and ways for attaining these goals, a curriculum plan is a result of decisions regarding three different matters: (1) selection and arrangement of content, (2) the choice of the learning experiences by which the content is to be manipulated and by which the objectives not achievable by content alone can be attained, and (3) plans for the optimum conditions for learning.'

In the context of corporate education, curriculum is defined as:
- the course of action open to an organization
- for influencing the necessary skills of employees
- that contribute to goal-oriented changes in their performance and in their work environment
- thus striving for a desired impact on the organization
- by applying planned learning activities and the resulting learning processes.

In Section 2.1 the theory distinguishes between two principal curricula:
- the ideal curriculum: what should be strived for, and
- the attained curriculum: what has been achieved.

Ultimately, the concept of curriculum consistency refers to the degree of congruence between the ideal and the attained curriculum.

External Consistency

External consistency refers to the coherence between the perceptions of the above mentioned curricula by (top) management, developer, supervisor, trainer and trainee (the actors) (Section 2.2.). External consistency not only depends on activities of the developer but is also favoured by a positive learning climate and an active corporate education policy.

Internal Consistency

As well as having external consistency among the actors' perceptions, a curriculum should be consistent in itself. This concept of internal consistency applies to the logic contingencies between
- the changes that are needed in the work environment,

- the necessary skills of managers and employees to bring about these changes, and
- the learning situations that facilitate the acquisition of these skills.

By the same token, internal consistency also implies that
- learning processes should enable employees
- to acquire skills
- that influence their performance, so that
- the affected work environment has
- an impact on the organization.

The concept of curriculum consistency - the contingencies between its elements and the congruences between its appearances - is an elaboration of Stake's model for curriculum evaluation (Stake, 1973). Throughout this study, curriculum consistency, both internal and external, is used as a descriptive framework for quality in corporate education (Section 2.2).

Design Approaches

The main purpose of developing and applying design standards is to improve the internal consistency of a curriculum and to gear towards a strong external consistency between the curriculum perceptions of the actors in corporate education, thus resulting in an attained curriculum that is consistent with the ideal curriculum.

When design instructions are to influence curriculum consistency, the question arises as to which mechanisms bring about internal and external consistency. The theory developed here advocates a systematic and a relational approach that seem to trigger a powerful combination of systems thinking and social integration (Chapter 3). The integration of a systematic and relational approach in design instructions is held responsible for curriculum consistency and subsequently for corporate education of a high standard.

Systematic Approach

The systematic approach implies the logical design sequence of orientation, design, development, implementation and evaluation. (Branson & Grow, 1987; Nadler, 1982; Nijhof, 1983, 1993; Plomp, 1982; 1992; Romiszowski, 1981, 1984; Rothwell & Kazanas, 1992; Tracey, 1971,

1984). Specific instruments used are needs assessment techniques, instructional objectives, learning strategies, training materials, guidelines for trainers and evaluation instruments. The systematic approach, when skilfully applied, leads to a well structured and logically ordered programme design with a strong internal consistency (Chapter 4). This design on paper is referred to as the formal curriculum.

Relational Approach

The relational approach provides activities that challenge actors to become involved in the design and implementation process and that reveal their perceptions of the ideal curriculum. When the mutual perceptions are explicit, they can be modified and slowly become compatible. The relational approach facilitates actors' involvement in the design and implementation process and has an impact on management commitment to corporate education. When skilfully applied, the relational approach leads to a strong external consistency among actors' curriculum perceptions (Chapter 5).

Two empirical studies

The basis for design instructions that enhance curriculum consistency is found in existing theory and in analysis of empirical findings. The empirical research that was carried out in this study encompasses four main stages: analysis of 17 contrasting cases, development of design instructions, the training of 30 developers, and finally the development, implementation and evaluation of 28 new curriculum projects.

17 Case studies

The cases, comprising existing training programmes in 8 different organizations, were divided in two contrasting groups - 9 successful and 8 unsuccessful. The cases were analyzed on the degree of internal and external consistency, and to see whether the systematic and relational design approaches had been applied (Chapters 7, 8 and 9). The characteristics found were related to the attained effects. Most successful cases showed strong internal and external consistency. They also revealed a strong systematic and relational design approach. The unsuccessful cases showed weak curriculum consistency, both internal as well as external.

Both the systematic and relational design approaches were poor in the unsuccessful cases.

Development of Design Standards

In addition to theoretical justification, the case studies provided an empirical basis for a new set of curriculum design procedures (Chapter 10 and Part III), which were to be tested in the second empirical study.

Training of 30 Developers

At the outset of the second empirical study, 30 developers were trained in mastering the design instructions. The training course took place over a period of eight months during which the participants worked simultaneously (but not full time) on projects to be implemented in their organizations (Chapter 11).

28 Curriculum projects

The design instructions used in this second study incorporated the systematic approach and the relational approach. Besides the replication of the case study, the main hypothesis of the second study was as follows: the skilful application of design standards, based on a relational and systematic approach, will generate educational programmes that accomplish better results than programmes that are not supported by such approaches (Chapters 12, 13 and 14). 28 Projects were submitted for further research.

Three judges per project assessed the curriculum documents. Up to nine months later, data on the attained curriculum were collected by means of a questionnaire from (top) management, supervisor, trainer, trainees and developer.

Summary of the findings

The research questions will be answered here, to the extent permitted by the limitations of the study:

Question 1:
Which factors in curriculum design influence quality in corporate education?

A theory on curriculum consistency has been developed int the conceptual framework. Its paradigms are:

A. Systematic Approach
A systematic approach generates logical contingencies among purpose, objectives, evaluation criteria and instruments, and the instruction presentation. The systematic approach effects an internally consistent formal curriculum and enables powerful educational interventions. Consequently, an internally consistent curriculum enables the acquisition of new skills, improvement of performance and a positive impact on the work environment.

B. Relational Approach
A relational approach stimulates management involvement and team work during the design and implementation process. It engages trainers with practical experience in the subject matter field and facilitates learning situations that resemble the work environment. The relational approach generates external consistency, defined as homogeneous notions of the parties involved on the nature of the problem and possible solutions through educational provisions. When managers, supervisors, developer, trainers, and trainees share coherent opinions about the purpose and strategy, their efforts will lead to successful programme implementation, favourable transfer conditions and positive effects.

The research findings have inferred empirical evidence for the operation of the systematic and the relational approaches. Practical experience of the trainer and external consistency appear to be conditions for internally consistent curricula to become effective. Moreover, without these preconditions, an internally consistent curriculum can become counterproductive.

Question 2:
How do these factors operate?

The systematic approach involves a logical and intellectual endeavour. The developer collects data on the desired outcome, and the target group, analyzes, draws up a plan, selects instructional strategies and constructs

course materials. Intellectual versatility and skilful application of instructional theory are major ingredients. The study shows that efforts to take a systematic approach proportionally increase the internal consistency of the curriculum. An internally consistent curriculum facilitates efficient acquisition of new skills.

The relational approach involves social interventions and skilled communicative interaction. The developer organizes meetings and interviews managers, supervisors, employees, potential trainees and trainers. These procedures entail consulting with concerned parties, problem solving, negotiating, reaching a consensus, gaining support, and strategically applying gentle pushes and decisive pulls. The goal of these efforts is to achieve a consensus among parties involved on methods of solving the problem, implementing the programme, and creating favourable transfer conditions in the work environment. The study shows that external consistency favours the transition of learning results and skills into improved performance. Managerial involvement and close links with the work environment are essential for gaining external consistency.

External consistency is a prerequisite for optimal benefits from the formal curriculum. It appears, however, that external consistency does not increase in proportion to the amount of energy the developer puts into the relational approach. The organization must also react positively to the developer's efforts. It really does take two to tango. In the framework of a single programme, it is unlikely that the developer achieves high external consistency when the organizational system fails to respond. If the training function is isolated position or has a negative image, the first attempts at a relational approach will not automatically result in strong external consistency and consequently in effective programmes. It is obvious that, apart from the inductive activities of a single programme developer, an organization will benefit most from the relational approach when the educational policy at the managerial level advocates an integrated curriculum design. Thus, quality in corporate education is not solely dependent on skilful application of relational and systematic approaches of the developer, but especially on the organizational climate in which an integrated educational strategy can flourish. However, a developer cannot change these factors within the framework of a single curriculum design. Over time, reiteration of integrated curriculum design will probably lead to external consistency and thus enhance positive effects.

Question 3:
Can design standards control these factors?

The developers that participated in this study were trained in the application of design standards that emphasize both the systematic and the relational approach. Experienced specialists with excellent reputations in the training profession assessed the designed curricula. The values for the systematic approach, internal consistency and relational approach as well as those of their constituting elements were all satisfactory (> 3.00 on a five-point scale). When we investigated the effects of the programmes, all projects passed the criterion for success. All but three projects satisfied the criterion for external consistency (> 3.00).

Cost-benefit analysis is the easiest factor to influence by design standards. The values for the adequacy of this variable were among the highest. This result was surprising, as the preceding case study showed very poor performance on this item. However, the cost-benefit analysis does not have a significant impact on programme effects.

The procedures for systematic curriculum design were adopted successfully and generated programmes with high internal consistency. This quality has a distinct impact on effects, provided that the programme is embedded in an externally consistent environment.

The procedures that encouraged the developer to apply a relational approach during the design process were implemented properly. Unfortunately, their intended impact on external curriculum consistency could not be measured due to psychometric limitations in the data, caused by small variances. Nevertheless, comparable achievements in the case study clearly show effects on external consistency and programme outcome.

In view of the preceding, the answer to the third research question is affirmative. The design standards with which the developers were provided could be mastered within a period of eight months and successfully applied to their projects. The programmes, based on the design standards, were effective, as perceived by the various actors.

Revision of the Design Standards

At the outset of the research project, the intention was to revise the design standards on the basis of the findings of the second empirical

study. In the study, experts assessed the curriculum documents and rated 26 items on a five-point scale (1 = highly inadequate/inconsistent, 5 = highly adequate/consistent). The criterion for revision was $\overline{X} < 3.50$. No items failed to meet this standard. The item with the lowest score ($\overline{X} = 3.57$) referred to the consistency between established evaluation criteria on the one hand, and preceding training need and instructional objectives on the other hand. In the revised version (Part III) this item has been amended, though it passed the criterion for revision. Furthermore, the developers' course has been adapted as regards this difficult aspect.

The developers were asked to evaluate the design standards. In addition to enthusiastic responses, some alterations on layout and sequencing were recommended. The revised version has adopted these suggestions. In this final version, each design step concludes with a paragraph of references. In the developers' course, a selection of these reference materials were supplied. Hopefully, the expanded version will stimulate further inquiries and contributions from colleagues.

PART I: CONCEPTUAL FRAMEWORK

2 A THEORY OF CURRICULUM CONSISTENCY

This study focuses on curriculum consistency, here considered one of the attributes of corporate education that foremost determines its impact.
The adjective 'corporate' is used to distinguish between the educational provisions in labour organizations and those in public and vocational education. 'Education' is used to indicate the variety of planned learning provisions for immediate and future required competencies in an organization.

Nadler (1980, 1984) differentiates between training, education and development, and provides a definition for each: 'Training activities focus on learning the skills, knowledge, and attitudes required to initially perform a job or task or to improve upon the performance of a current job or task'. 'Education focuses on learning new skills, knowledge, and attitudes that will equip an individual to assume a new job or to do a different task at some predetermined future time'. 'Development activities are not job related but are oriented to both personal and organizational growth. The focus of such activities is on broadening the learner's conceptual and perceptual base in areas not previously explored or experienced by the individual'.

Many authors adopt these distinctions, but often end up with the statement that they will use the terms interchangeably (Patrick, 1992). Very often, the combination 'training & development' is used without mentioning 'education' to denote the educational activities in this field. The confusing use of the terms is somehow inherent in Nadler's definitions. The generally accepted distinction between skills, knowledge and attitudes is of little practical value, as the activities aim at performance improvement, which requires application of skill. Moreover, Nadler's definition of development states neither knowledge, skills, nor attitude. What does development focus on? On personal and organizational growth, which by its very nature implies skills, knowledge and attitude. Furthermore, the distinction between training and education is less obvious: training applies to current job performance, education to known prerequisites for a future job. The only difference is that in the case of the latter, practical application of results is postponed for one to two years, which makes education a rather ambiguous enterprise when its effects are considered.

This study prefers the generic concept of corporate education, which spans the entire gamut from the delivery of educational services to an organization, touching all levels and classifications of employees; it is affected by conditions external to an organization, the competitive forces within a given industry, and the nature of a company's business. The Carnegie Foundation Special Report on Corporate Classrooms (Eurich, 1985), Hawthorne's study (Hawthorne, 1987), and Cummings & Parks (1991) use descriptions of educational provisions that support this definition of corporate education. Corporate education is used here with the same connotation as other authors use the term human resource development: 'organized learning provided by employers within a specified period of time to bring about the possibility of performance improvement and/or personal growth' (Harrison, 1992, p. 4; Nadler, 1980; Nadler & Nadler 1989, 1992; Nadler & Wiggs, 1989; Tracey, 1991, p. 159).

Throughout the study, the immediate results of an educational programme are expressed in terms of skills, thus avoiding the often confusing separation of skills, knowledge and attitudes. The existence of the differences is not denied, but for practical reasons we adhere to Romiszowski's skill typology (1981, 1984) and distinguish between cognitive, psychomotor, reactive and interactive skills.

In literature the definitions of 'curriculum' are abundant, as are the discussions about their usefulness (Jackson, 1992). Taba's description of the term curriculum as 'essentially a plan for learning' (Taba, 1962) suits very well the purpose of this study. The curriculum should not be seen as being restricted to documents. The concept also includes perceptions of goals and technology to be applied. An example of this wider use of the term curriculum is the classical concept of the 'hidden curriculum' (Jackson, 1992; Snyder, 1973; Vallance, 1991 in Houben, 1993).

In the context of corporate education, curriculum is defined as:
- the course of action open to an organization,
- for influencing the necessary skills of employees,
- that contribute to goal oriented changes in their performance and in their work environment,
- thus striving for a desired impact on the organization,
- by applying planned learning activities and the resulting learning processes.

Throughout this study, the curriculum is examined on micro level which deals with course design (Houben, 1993; Nijhof, 1993a) and is

approached from a technological perspective (Eisner & Vallance, 1974). From this perspective the development of cost-efficient means to attain specified goals is dominant. This technological orientation will lead to improved design standards as the main product of this study.

The term 'consistency' serves to describe the congruencies among the various perceptions of a curriculum and the contingencies between elements within a curriculum. In the following section the concept of curriculum consistency is further explored by means of a curriculum typology specifically developed for corporate education.

2.1 A curriculum typology for corporate education

The aim of this study is to develop a prescriptive theory and validated design standards for corporate education, and it addresses the following research questions:

1. What factors in curriculum design influence quality in corporate education?
2. How do these factors operate?
3. Can they be controlled by design standards?

Further inquiry in this field creates a demand for a conceptual framework that structures the constituent components and their relationships. The curriculum is the principal unit of analysis, but it has many forms. The curriculum as a blue-print for an educational provision is one of these. The facilitator of this provision interprets the blueprint, and puts it into action. This curriculum, as it is perceived by the trainer and then operationalized in instructional events, becomes another set of forms. Employees who participate in the learning situation generate their own perceptions, as well as their managers, who have an interest in the results to be attained. The paper curriculum that is secluded in documents, the virtual curriculum that can be observed and the various individual perceptions of an educational provision too are aspects to be analyzed when searching for answers to the questions above. One of the first necessary steps is to develop a curriculum typology that denominates the curricula involved and structures their relationships.

In corporate education, curriculum theory and curricular studies are scarce. In public education, curriculum planning and organization is studied on societal, institutional and instructional levels (Goodland & Su, 1992). Compared to corporate education the societal level plays a role of

minor importance. Nevertheless society and macro economics do influence corporate education. The institutional level has an impact in so far as an organization and its education department developed and implemented a policy on educational issues. The typology to be described here focuses primarily on the instructional level.

Goodlad's curriculum typology (Goodlad, Klein, & Tye, 1979) and its thorough analysis by Van den Akker (1988) provide a springboard for the development of a curriculum typology for use in corporate education. However, for the application of these concepts in this context other labels have been used. Furthermore, much emphasis has been placed on the contingencies between the subsequent curricula. Moreover, the consistency between the curricula will be considered as an expression of their quality. It is this concept of consistency that leads to the major hypotheses of this research. The modified version of Goodlad's curriculum typology is depicted in Figure 2-1. The arrows and dotted arrows indicate the mutual influences of the related elements that are described in the following sections.

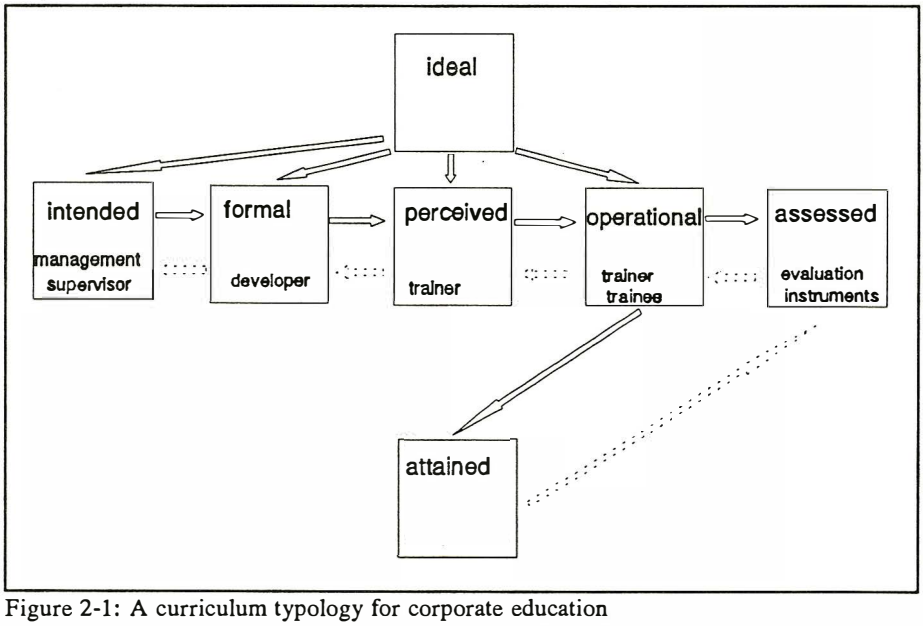


Figure 2-1: A curriculum typology for corporate education

2.1.1 Ideal curriculum

The ideal curriculum is conceived of as the most adequate set of learning situations that contributes to solving an existing or future performance problem in an organization. An ideal curriculum exists only when the performance problem is totally or partially caused by a lack of skills, competencies or abilities in the employee or group of employees. In that case, part of the solution to the performance problem can be achieved by learning processes that provide the employee with those necessary skills, competencies and abilities. Thus, the ideal curriculum describes the most adequate learning situations that enable the trainee to develop new skills in order to solve an existing performance problem in the workplace or to prevent a performance problem in the near future.

When applying the general characteristics of an adequate solution in the context of educational technology, as described by Plomp (1982, 1992), the ideal curriculum is:

a. sufficiently specific to be effective;
b. user-friendly, in the sense that it does not create new problems;
c. acceptable and not resisted;
d. feasible, given the time, money and human resources available.

The ideal curriculum is not necessarily the best solution theoretically, but it is the solution that provides the highest functionality in the present situation.

As stated, the ideal curriculum describes the most adequate set of learning situations. Therefore, it exists as a postulated construct and is in no way tangible. In other words, it is the curriculum that would be designed if the perfect needs assessment could be conducted. The concept of the ideal curriculum as used in this study differs from Goodlad's in the sense that it is not a product of individuals or of an official body and that it is therefore intangible. The ideal curriculum serves as an abstract reference model to all parties involved in an educational programme: managers, supervisors, developers, trainers, and trainees. Their perceptions of the ideal curriculum should be jointly developed into a clear vision of the purpose, objectives and activities, which can make their educational efforts effective.

In this respect it is interesting to read in the early work of Bobbitt that the curriculum has to be 'discovered' by analytic survey. 'The curriculum-discoverer will first be an analyst of human affairs... This requires only that one go out into the world of affairs and discover the particulars of which these affairs consist.' (Bobbitt, 1918 pp. 42-43).

For this research project a model of the ideal curriculum was built. This reference model contains four systems elements by which the appropriateness of the designed curricula that are found in reality can be judged. The elements of the ideal curriculum are shown in Figure 2-2.

Problem - Goal

In the context of corporate education, curriculum design is meant to offer an adequate contribution to the solution to a given problem in the organization. Sometimes the problem to be solved is expressed as a challenge. The problem may arise when the organization tries to achieve corporate goals and puts related strategies into action. Therefore, corporate education is a goal oriented activity which contributes to both solving actual problems and to preventing the rise of future problems (Harrison, 1992).

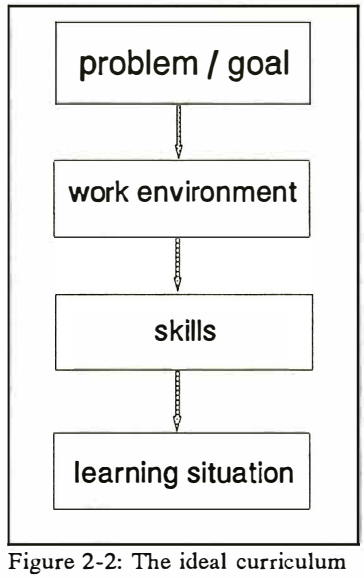


Figure 2-2: The ideal curriculum

Work environment

Unless (top-)management has a clear view of the desired work environment in which it is possible to achieve the above mentioned goals, designing training programmes is of little use. Only when the desired changes in the work environment are clearly stated, might training programmes contribute effectively (Latham & Crandall, 1991). If the root causes of a performance gap are environmental or motivational in nature, the design of interventions is of a non-instructional character (Stolovitch & Keeps, 1992).

Skills

Designing and conducting effective training programmes requires that all actors, amongst others (top) management, developer, trainer, trainee and supervisor, should have a clear view of the skills, competencies and abilities the trainees need to acquire in order to effect the desired changes in the work environment. Some authors, for example Schendel and Hagman (1991), use the term 'skill' in a restricted sense and refer to learned behaviours that depend heavily on motor processes and on physical performance. In this study a broader concept of skill is advocated. Here, Annett's description of skill is adopted, which refers to a behavioural solution to a particular class of problems. The defining characteristics of a

skill are that it involves behaviour that is goal-directed, well organized and economical of effort. It is acquired through training and practice rather than being innate or instinctive (Annett, 1991). Knowledge, concepts, principles and attitudes as such are important training results, but until these are transformed into applicable skills, they will be of little use in the process of creating changes in the work environment and of solving organizational problems (Blank, 1982; Field & Drysdale, 1991; Kessels & Smit, 1991). For devising instructional strategies Romiszowski's four categories of skills have been adopted: cognitive, psychomotor, reactive and interactive skills (Romiszowski, 1981, 1984).

Learning situation
The product of the design process is a series of situations that offers the necessary learning experiences for trainees to acquire the above mentioned skills. The learning situation is not restricted to classroom instruction. It may consist of small-group activities, projects, computer-mediated instruction, resource management systems, on-the-job training, distance education and accelerated learning systems (Stolovitch & Keeps, 1992). The learning situation can be any provision of planned learning activities.

> 'The training needs to be taken care of where the work can be normal, not where it may be most convenient for teachers' (Bobbitt, 1918, p. 35).

2.1.2 Attained curriculum

The attained curriculum consists of all the effects that are caused by the training programme. Of foremost importance is the learning situation that evokes learning processes in the trainee. The resulting changes in skills have an effect on performance in the work environment, including the effects on colleagues and managers. Ultimately, they have an impact on the organization, namely to the extent goals have been attained or the problem solved (see Figure 2-3).

What is being assessed, 'the assessed curriculum', as described later, is only part of the attained curriculum. The latter contains not only the formally assessed training results, but also all non-explicit changes, its influences on the trainee and on his or her environment, caused by the development and the implementation of a training programme. The assessed curriculum is only that part of the attained curriculum that has been made visible by means of evaluation instruments. The attained curriculum should incorporate the solution to the problem that was stated

at the outset of the design process.

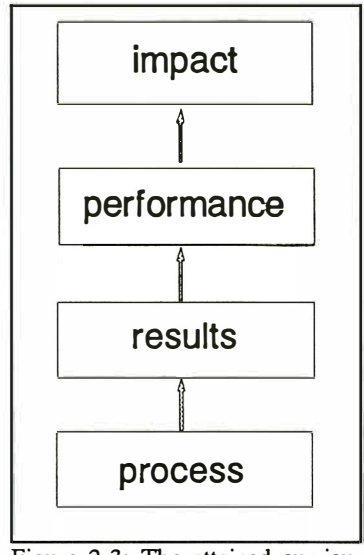


Figure 2-3: The attained curriculum

If the training programme brings about the desired changes in the skills of the trainee, however, this does not automatically mean that these will have an impact on the organization. Robinson and Robinson (1989) define three major areas which present barriers that prevent newly acquired skills from being integrated in the work environment. These barriers are created by conditions of the learner, the immediate managers and the organization. According to Robinson and Robinson, it is the conditions of the immediate managers that constitute the highest barriers to skill transfer. Managers and supervisors do not tend to reinforce the learners' use of the skills (92%), they are not positive models (88%) and they do not coach learners in the use of the skills (85%). This means that training programmes in the context of corporate education always need to be accompanied by activities that encourage the skill transfer. Immediate managers and supervisors should therefore be the focal point of these activities.

2.1.3 Intended curriculum

The intended curriculum is conceived of as the assignment given by (top) management to the training department or training agency. This assignment is the request to design and conduct a training programme that provides a solution to the perceived performance problem in the company. Ideally, management should state what the problem is, how much of it is caused by a lack of skills in the employees, and how it can be resolved by training activities. Management should also state what it will do to create favourable conditions in the work environment for the acquired skills to be transferred, thus attaining the desired performance. The closer the intended curriculum matches the criteria of the ideal curriculum, the higher its quality will be. Paraphrasing Goodlad (1984, p. 57) it is important that top management (the state) defines and clarifies the educational gap. Articulation of this gap will define educational needs and motivate people to participate in change and reform. In reality,

however, the intended curriculum is often far from the kind of assignment described above.

2.1.4 Formal curriculum

The formal curriculum includes all documents, training materials, written instructions, schedules, exercises, software, evaluation formats, etc. of the training programme produced by the curriculum developer(s). According to Klein's curriculum framework (Klein, 1991), the formal curriculum should contain the following components:

Goals, objectives, purposes:
- The main goals of the training programme: in other words the desired outcome for the target group
- Report of needs and task analysis
- Instructional objectives

Evaluation criteria and instruments for
- reactions of trainees
- learning results
- performance in the workplace
- impact on the organization

Training content:
- Textbooks
- Reference materials

Teaching strategies and activities:
- Guides and manuals for the trainer
- Guides and manuals for coaches, supervisors, local managers, and others involved in the programme

Materials and resources:
- Exercises, case-studies, role plays, simulations, practice, software, video tapes, etc.
- Description of the equipment needed
- A cost-benefit analysis of the programme

Group, time and space:
- Grouping, group size
- Training schedule(s) and locations

The formal curriculum should reflect the curriculum that was requested by the assignment (the intended curriculum). Where the intended curriculum is poorly stated, the developer should conduct the assessment of training needs according to the systems elements of the ideal curriculum. It might even be possible for the intended curriculum to be absent, namely in those cases where no training programme was asked for.

The formal curriculum should reflect the ideal curriculum; its contents as described above bear great similarity to Goodlad's formal curriculum, but will consist of elements that are typical for the context of corporate education. Schrag uses the term 'manifest curriculum' to describe the variety of documents that make up the visible part of a curriculum. (Schrag, 1992, p. 277). The formal or manifest curriculum is an important unit of analysis in this research project. According to Schrag, curriculum documents are like music scores. Both must be enacted and interpreted: the music score to become music, curriculum documents to become educational experiences. Therefore, further analysis of the curriculum typology is necessary.

2.1.5 Perceived curriculum

The perceived curriculum reflects the trainer's perception of the curriculum. When the developer and the trainer are not one and the same person, their perceptions of the purpose, the relevant objectives, and of the learning situations that will eventually lead to the desired training outcome may differ. The weaker the formal curriculum, the more variety the perceived curriculum will show among different trainers. Moreover, trainer perception of the original performance problem will influence beliefs about the exact training needed. If the intended curriculum is poorly worded and the formal curriculum insufficiently elaborated, it might even be possible that the trainer is not at all aware of the performance problem that needs solving. Moreover, the absence of an intended and formal curriculum might be compensated for by the trainer's practical experience in the work environment. In such a situation the perceived curriculum performs the function of the missing curricula. The perceived curriculum as outlined here is very close to Goodlad's description. In this research the perceived curriculum refers specifically to the perceptions of the trainer(s). For the analysis of the perceptions of management, the intended curriculum is used. The formal curriculum is used for analysing the perceptions of the developer. The operational curriculum is the basis for studying the trainees' perceptions.

2.1.6 Operational curriculum

The operational curriculum is the curriculum as it presents itself in the real learning situation. It consists of the factual learning situations that are created, the interaction between trainer and trainee, the trainee working with the curriculum materials, and the learning processes that occur. In reality the operational curriculum can be found in classrooms, in practical work supervised by a coach or carried out independently by the trainee, in special projects, in doing homework, in a simulated work environment, etc. The operational curriculum is similar to Goodlad's operational curriculum, however, as the created learning environment is that of a labour organization and not the one of a school context.

2.1.7 Assessed curriculum

The assessed curriculum contains all the formal outputs and outcomes of a training programme that are recorded by means of evaluation instruments. The learning situation is designed to evoke learning processes. Subsequently the evaluation of training programmes should show a chain of evidence between the experienced learning *process*, the training *results* in terms of skills, the effects on *performance* in the work environment and the *impact* of these changes on the initial organizational problem posed (Hawthorne, 1987; Kaufman, 1982, 1990; Kaufman, Wager & Mayer, 1981; Kessels & Smit, 1991; Kirkpatrick, 1975; Robinson & Robinson, 1989).

When the programme is successful, the reactions to the learning process should be positive, the learning results must reflect the instructional objectives, the performance problems should be resolved and the organization should perform better. Here assessment and evaluation are used for the information gathering processes and their products that are related to the systems elements process, results, performance and impact of the attained curriculum (see Figure 2-3). So assessment and evaluation are used in a wider sense than student and programme appraisal as suggested by Madaus and Kellaghan (1992).

2.2 Curriculum consistency as a concept of quality

The curriculum typology as described in the previous section allows for the concept of quality in corporate education being operationalized in terms of curriculum consistency.

2.2.1 Consistency: ideal and attained curriculum

The ideal curriculum states the theoretically most adequate contribution of training to solving a problem in the organization and the attained curriculum states the factual training results and their impact on the organization. This means that the quality of corporate education is of a high level when the attained curriculum reflects the ideal curriculum. Quality is the degree of consistency between the ideal and attained curriculum (see Figure 2-4). Consistency indicates high quality, discrepancy indicates low quality.

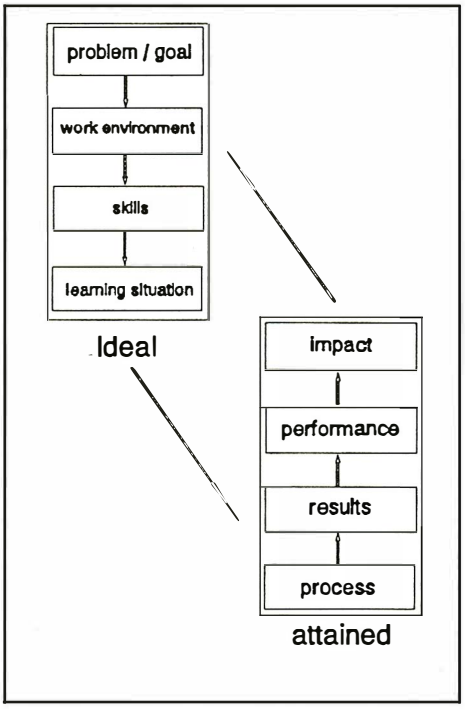


Figure 2-4: Consistency between ideal and attained curriculum

However, the ideal curriculum, being a postulated construct, is intangible; it will never be known. Nevertheless, in order to obtain an approach that comes close to the one prevailing in the ideal curriculum, needs assessment provides the basis for an intended curriculum, reflecting the ideal as far as possible. The same problem exists regarding the attained curriculum. We can improve on assessment and evaluation instruments in order to obtain a more refined description of the learning process, of its results, of the changes in performance and the impact on the organization. The total complexity of factual influences and changes created by an educational provision can not be recorded in detail. Although the ultimate measure of quality is the degree to which the attained curriculum reflects the ideal

curriculum, this measure is not accessible in reality. Proficient application of elaborate educational technology is to provide clear statements on the four system elements of the ideal and the four of the attained curriculum with the purpose of bringing these together as closely as possible.

The main task of professionals working in the field of corporate education is to improve their ideas and concepts of the ideal curriculum and to refine their instruments for obtaining access to the attained curriculum. These are major prerequisites for an intelligible discussion on quality in corporate education.

2.2.2 Consistency: Intended and assessed curriculum

If the ultimate measure of quality is expressed by the consistency between the ideal and attained curriculum, the nearest empirically attainable measure of quality is the degree of consistency or discrepancy between the intended and the assessed curriculum (see Figure 2-5). This means that in order to express the quality of training interventions, we have to confront the intended curriculum (the assignment from management to conduct training) with the assessed curriculum (the evaluation results). For such a confrontation, something that can be considered as the intended curriculum must be available. If there is an assignment from management to the training staff, it should contain information on the system elements described previously in the section on the ideal curriculum (Figure 2-4). It is important that the definition and analysis of the problem are related to the work environment of employees and management, to the improvement of skills, and to the necessary conditions allowing transfer of the newly acquired skills resulting in the desired performance. For purposes of comparison with the intended curriculum, the assessed curriculum should contain not only information on the trainees' reactions to the programme but also information on learning results, changes in performance and information on the causal relationship between training results, performance and their impact on the organization (see Figure 2-3: The attained curriculum). This relationship

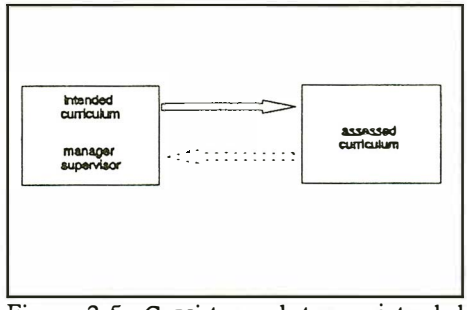


Figure 2-5: Consistency between intended and assessed curriculum

is facilitated or inhibited by favourable or unfavourable conditions in the work environment. Absence of this information both from the intended and the assessed curriculum will make judging quality very difficult to achieve.

2.2.3 Training intervention as a vehicle of change

The distance between the intended and the assessed curriculum is bridged by, in sequence, the formal, the perceived and the operational curriculum (see Figure 2-6). Achievement of the desired change in the organization requires the operational curriculum to reflect the training interventions in the ideal curriculum. According to the system elements of the ideal and attained curriculum (see Figure 2-4), performance requirements and objectives - stated in terms of skills - are dominant characteristics of corporate education. The trainer's perception of what kind of education is needed should therefore correspond to that. This demands that the formal curriculum contain the prerequisites and the careful design of the interventions needed.

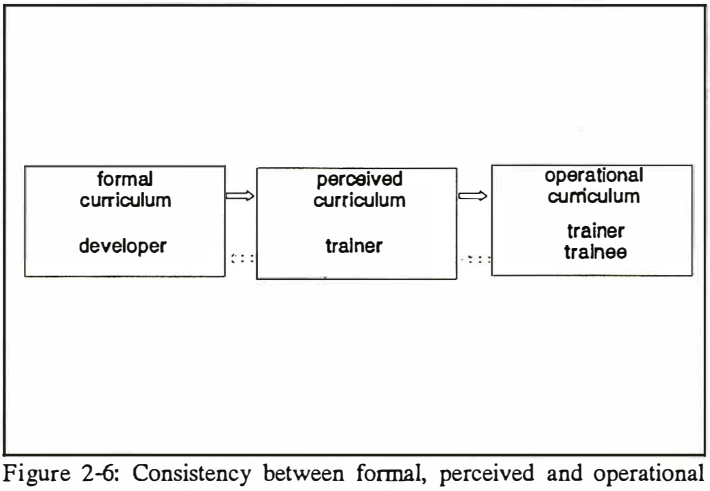


Figure 2-6: Consistency between formal, perceived and operational curriculum

Thus, the developer should design a formal curriculum that meets its purpose of obtaining instructional interventions that effect the desired change. The trainer's perception of these interventions and of his or her role therein should correspond to the developer's intentions as expressed

in the formal curriculum. When developer and trainer are not one and the same person, their intentions and perceptions may, naturally, differ. Trainers may have different perceptions of the performance problem. They may be strongly influenced by experiences from previous courses, e.g. a management theory that is greatly appreciated by trainees, or favoured interventions for interpersonal skills that have a strong impact on group dynamics. Previous experience of the trainer in the work environment of the trainees, or the absence of such practical experience, may also heavily colour the trainer's perceptions of the training intervention needed. In order to achieve the smallest possible discrepancy between the intended and the assessed curriculum, the formal, the perceived and the operational curriculum should be tied as closely and as consistently as possible.

2.2.4 External curriculum consistency

By definition, consistency between the subsequent curricula plays a dominant role in assessing quality in corporate education. However, a research design based on the concepts of ideal and attained curriculum will envisage many problems. As mentioned earlier, the ideal curriculum is an intangible construct. As soon as the researcher starts to operationalize this concept for data collection, the data found belong to either the intended curriculum (information from managers and supervisors), to the formal curriculum (documents and information from the developer), to the perceived curriculum (information from the trainer), and to the operational curriculum (information from the real learning environment and from the trainees).

The definition of the attained curriculum causes a similar problem: the moment the researcher starts gathering data on the attained curriculum, using evaluation instruments, the data belong by definition to the assessed curriculum. To avoid these theoretical problems, the more operational concept of external consistency is introduced. External consistency is defined as the homogeneity of the notions of parties involved on what the problem is and how it can be solved by means of educational provisions. The concept applies to the coherence of the perceptions of managers, supervisors, developer, trainer and trainees of the ideal and attained curriculum (see Figure 2-7).

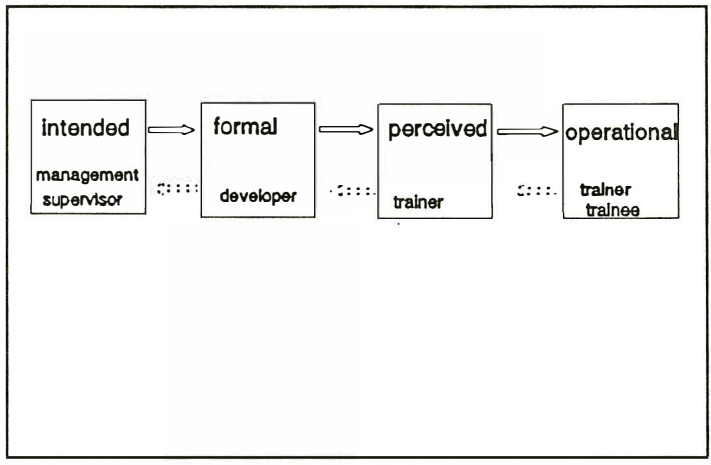


Figure 2-7: External curriculum consistency

External consistency refers to the congruence of the perceptions of the various actors and their beliefs about the programme (Mager & Pipe, 1984; Robinson & Robinson, 1989; Romiszowski, 1990)

The concept of external consistency is expected to play an important role in the implementation of training programmes. The compatibility of the actors' perceptions of the need and relevance of the programme and of the clarity of its outline are widely regarded as essential for successful implementation (Van den Akker, 1988; Fullan, 1982; Snyder, Bolin & Zumwalt, 1992). Implementation is defined as 'putting the change into action' (Fullan, 1982). In formal education, curriculum implementation is mostly regarded as putting into action changes in goals, organization, the role of the teacher, content, instructional strategies, classroom management, materials or evaluation (Snyder *et al.*, 1992). In corporate education the same elements are relevant when implementing curricula. As performance of employees is to be directly influenced by the curriculum and ultimately the effectiveness of the organization, curriculum implementation goes far beyond the classroom. Moreover, the trainee's work environment, wherein the supervisor and colleagues play a dominant role, is part of implementation as well, and is therefore object of the actions of change. Then, favourable and unfavourable conditions in the work environment strongly influence programme implementation. As implementation starts at the outset of programme development (Plomp, 1982), managers, supervisors and employees, who are the very constituents of these conditions, should play an important role in needs assessment, design and development.

In curriculum design, as in action based research, preliminary inquiry and strategy of change are closely interwoven. The strategy of change is based on fact finding and on explicit, designed cooperation between client and change agent (Van der Vegt, 1974). This assumption forms the rationale of the concept of external curriculum consistency and its relation to programme implementation.

2.2.5 Internal curriculum consistency

The four system elements of the ideal curriculum and those of the attained (see Figure 2-4) are closely interrelated. Ultimately, curriculum design strives for congruence between the ideal and attained curriculum. The synthesis of their eight elements provides a descriptive model allowing further analysis of the concept of curriculum consistency (see Figure 2-8).

Stake's model of curriculum evaluation is adopted to characterize the links between the various elements (Stake, 1973). The elements problem/ goal, work environment, skills and learning situation (originated from the ideal curriculum) show *logic* contingencies: corporate education is ultimately an instrument for organizational change, and intentionally planned learning situations should serve that purpose. The connection between organizational problems/goals and learning situations is established via changes in the work environment and the skills needed to support these changes.

The elements: process, results, performance and impact (originating in the attained curriculum) show *empirical* contingencies: the learning processes, of which the results - when applied - affect performance, that ultimately have an impact on the organization.

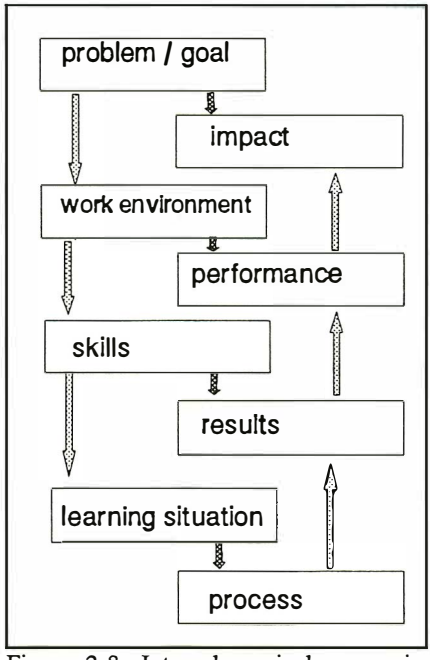


Figure 2-8: Internal curriculum consistency

The desired congruence between ideal and attained curriculum (in Figure 2-4) is represented by the lateral pairs of elements (in Figure 2-8): problem/goal states the desired impact; statements on the work environment define the desired performance; objectives, stated in terms of skills, define the desired results; the learning situation is designed to evoke learning processes.

This constellation of elements, their contingencies and congruences constitute curriculum consistency, which we term here internal curriculum consistency.

Through examining the intermediate curricula of the typology an equivalent internal consistency should be found. The formal curriculum in particular ought to show this internal consistency (see Figure 2-9).

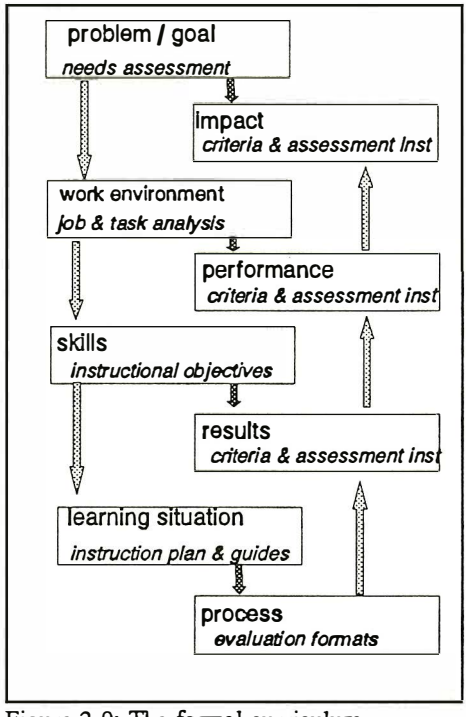


Figure 2-9: The formal curriculum

When responsible line management and developer conduct needs assessment they examine the initial problem and the related organizational goals. The results of needs assessment form the basis for evaluation criteria and assessment instruments on the impact level. The output of needs assessment directs the investigation of the desired changes in work environment, which is carried out by means of job and task analysis. The results of these analyses are translated into instructional objectives stated in terms of cognitive, interactive, reactive and psycho-motor skills. They also serve as the basis for evaluation criteria and assessment instruments on the performance level. The objectives form the guidelines for evaluation criteria and assessment instruments for the results on the skills level, for the lay-out of the learning situation, the selection of instructional strategies, content, and for the development of plan, materials, and guides for trainers and coaches.

The formal curriculum holds a central position in the preparation of educational programmes: the developer attempts to materialize the ideal curriculum. It reflects more than just the developer's perception of the ideal curriculum: by applying a systems approach the formal curriculum contains the products of a thorough problem-solving and decision-making process and the careful design of plans and materials needed to enact and evaluate effective, efficient and productive learning. Internal consistency of the formal curriculum is a crucial component in the overall consistency of the curriculum typology and therefore an important attribute of quality in corporate education.

Interest in internal curriculum consistency emerged long after progress had been made on taxonomies of behavioural outcomes and unbiased testing. Though the importance of having correctly stated instructional objectives was widely accepted, little concern was expressed about their appropriateness. The same problem arose with testing. In educational psychology much effort has been devoted to prescriptions for the construction of reliable tests and items of high technical quality. The attention given to the aspect of validity and measuring what was right and relevant lagged behind. Merrill, Reigeluth and Faust (1979), amongst others, acknowledged these shortcomings. In collaboration with the Navy Personnel Research and Development Centre, they examined extensively the consistency between the purpose of instruction, the objectives, the tests and the presentation of instruction. Their efforts resulted in the Instructional Quality Profile - IQP (Merrill *et al.*, 1979). The IQP provides a set of detailed procedures for analysing consistency and adequacy of instructional components. The same principles of inquiry will be applied in assessing the internal consistency of the formal curricula in this research project.

2.3 Curriculum consistency and transfer

In the context of education, the term 'transfer' is used to describe various processes. The Human Resources Glossary (Tracey, 1991) offers two descriptions:

1. 'Transfer of learning is the ability to transfer knowledge or skills learned in one discipline or context to another field of endeavour or situation'.
2. '..the ability, inclination, and habit of applying knowledge and skills learned in a training programme to the performance of the job'.

Patrick (1992) differentiates types of transfer as follows:

1. 'Transfer of a trainee's existing skills and knowledge to the training of a new task'.
2. 'Transfer from part-task training to whole-task training'.
3. 'Transfer from training exercises to unsupported performance at the end of training'.
4. 'Transfer from the training environment to performance of a job or task in its natural context'.

Similar distinctions have been made by Simons, who emphasises the 'ability' for transfer (Simons, 1990, 1992).

On the one hand transfer is considered a cognitive-behavioural phenomenon that involves information processing, meta cognitive skills and inferential reasoning (Patrick, 1992; Vázquez-Abad & Winer, 1992)(the first category of transfer). Thus, transfer from task A to task B tends to revolve around interpretations of the similarity relationship (Holding, 1991), which raises the question of the physical and functional fidelity of the training situation, an aspect that became a focal point in the design of simulator training.

On the other hand transfer is considered a process of social integration. This integration of training results in performance is strongly influenced by trainee, line management and work environment characteristics (Broad & Newstrom, 1992; Robinson & Robinson, 1989)(the second category of transfer). Den Ouden (1992) conducted research on the influence of planned behaviour by the trainee and of social support in the work environment. Most researchers consider the role of local management and supervisor of prominent importance for positive transfer, provided that the trainee has acquired skills and that these are relevant for the job (Field & Drysdale, 1991; Wexley, 1984).

Broad and Newstrom (1992) report on a study by Newstrom, which showed that - according to trainer's perceptions - the following barriers to transfer are the most important: lack of reinforcement on the job, interference from immediate (work)environment, non supportive organizational culture, impractical training programmes, irrelevant training content and discomfort with change and associated effort. Latham and Crandall (1991) mention amongst others organizational culture and social variables such as unconstructive peer group and supervisory support as major barriers to transfer. In one of the preceding sections, references have been made to the work of Robinson and Robinson (1989), who also

focus on conditions of the learner, the immediate managers and the organization.

Transfer barriers limit the realized changes of performance and impact on an organization. In a review, Latham and Crandall (1991) estimated that only 10% of expenditures for training resulted in observable behaviour change on the job. Broad & Newstrom (1992) refer to different research but mention the same low payoff of 10%. Romiszowski (1990) refers to estimates ranging from 50% to in excess of 70% of the total USA corporate training budget that is largely wasted, because many of the problems that corporations typically try to resolve by training their personnel cannot be resolved by training or at least not by training alone. One of Vázquez-Abad's and Winer's conclusions in their article on emerging trends in instructional interventions is: 'One of the main problems facing North American industry derives from inappropriate training practices. Traditional instructional practices are increasingly being pointed out as a major culprit' (Vázquez-Abad & Winer, 1992, p. 683). Before putting all the blame on the training profession, it is vital to examine the question of transfer in more detail.

Transfer problems of the first category, those caused by lack of adequate (meta)cognitive skills, may be addressed by a more refined task analysis appropriate for analysing information-processing requirements, ability requirements and knowledge representation (Clark, 1991; Patrick, 1991; Pieters, 1992b). Thus, the design of specific learning situations consistent with the previous analysis could resolve some of these transfer questions. In fact this is an approach that improves on the internal consistency of the formal curriculum: a more refined analysis of the tasks, resulting in more valid objectives, leading to training interventions consistent with the previous systems elements. This refinement requires profound expertise in cognitivist analysis and information-processing representation.

For solving transfer problems of the second category, those causing poor integration of newly acquired skills in the work environment, many suggestions have been found in literature. Broad & Newstrom (1992) identify 89 transfer strategies (41 for the manager, 34 for the trainer and 14 for the trainee) to be applied before, during and after the training. Many of these strategies and others found, try to facilitate the trainee overstepping the line between training and work. The trainee is offered help, assertiveness is improved and supervisor support is encouraged. In fact, these efforts attempt to interconnect a detached learning situation with the work environment. Even when on-the-job training is carried out,

transfer problems may occur, because learning is looked at as being different from working. Nonetheless, this type of transfer problem is rarely regarded as a segregation problem, particularly as it is located in the transition of newly acquired skills into performance. Conventionally, it is implicitly acknowledged that acquiring skills is a matter of training and that performance is a matter of management. Consequently, when transfer problems of this kind arise, they reveal a lack of coherence in the perceptions of developers/trainers and managers/supervisors. Inconsistencies between judgments of the desired improvement of performance and of the means to that end lie at their basis. Thus, transfer problems can be explained as poor external curriculum consistency. When transfer problems of this kind occur, one or more combinations of intended, formal, perceived and operational curriculum are not compatible.

In the previous sections, curriculum in the context of corporate education is defined as

- the course of action open to an organization,
- for influencing the necessary skills of employees,
- that contribute to goal-directed changes in their performance and in their work environment,
- thus striving for a desired impact on the organization,
- by applying planned learning activities and their resulting learning processes.

So, learning does not stop once the skills have been acquired. Learning, in fact, goes on, and colleagues, supervisors and managers are major actors in the learning processes that bring about the desired changes in performance, work environment and ultimate impact. This indicates that, when exploring the purpose for change during needs assessment, apart from training components and non-training components favourable and unfavourable conditions in the work environment should also be considered. The segregation of training and work, and so of skill and performance, is to be prevented by an organization oriented approach in the needs assessment phase. During this initial phase, management (intended), and developer (formal curriculum) should agree on a coherent set of goals and supporting conditions. External consistency between intended and formal curriculum in this stage deflects transfer problems in a later phase. Subsequently, full range implementation of a curriculum requires supervisors and managers to implement the non-training components, to create favourable conditions and to repel unfavourable conditions.

This part of the manager's job creates a demand for implementation skills, a prerequisite often neglected. The acknowledgment that a curriculum not only affects the initial target group, but also the system in which it is embedded, has several implications:

a. In a consistent curriculum, trainees, as well as those charged with design and implementation are learners.

b. Corporate education blends in with categories of interventions known as performance technology (Gilbert, 1978; Harless, 1979; Romiszowski, 1981, 1990; Rosenberg, Coscarelli & Hutchison, 1992; Stolovitch & Keeps, 1992), planned change and organization development (Argyris, 1985; Argyris & Schön, 1974, 1978; Bennis, Benne & Chin, 1969; Schein, 1985; Van der Vegt, 1974).

c. Context and conditions of educational provisions are variables subject to the influence of the ideal curriculum.

As an educational programme aims not only at the acquisition of new skills, but also at the transition of these skills into improved performance, problematic transfer is to be treated as a symptom of external inconsistency.

The following examples may illustrate the presented way of reasoning.

A. A banking corporation sent their frontline employees to a course on customer relations. However, application of the new skills in addressing a client effected an increase of the average client contact time. As a result, clients were queuing up in long lines during busy periods. The supervisor considered this effect as not being client centred. So, she urged her employees to speed up; they soon resumed working as usual.

B. The city social security service received many complaints from clients on the difficulties grasping the meaning of formal correspondence. A writing course on the use of less formal language did not reduce the amount of grievances. Further analysis revealed that the pre-printed letter formats had not been adapted and were still in use.

C. Student nurses were asked to draw up a detailed patient report, containing not only medical facts, but also interview records on

the patient's attitude towards his or her illness, the effect of hospitalization, the reactions to medical and social treatment, etc. This was a training task for introducing them to a holistic approach to health care. The head nurse disapproved of this activity; in this hospital such records were not kept and due to lack of staff, no time was available for interviewing patients. Subsequently, students started inventing patient case histories, fulfilling the training task without upsetting the head nurse.

In example A the skills are relevant but the goals of customer relations needed a more intricate solution. Involving supervisor and front liners in needs assessment would have resulted in a more elaborate approach.

In example B needs assessment had not been carried out. The complaints were not a result of inadequate writing skills, but of the provision of inadequate tools. Neither the civil servants nor the trainers had been informed of the grievances of clients and were ignorant of the problem.

In example C the trainer's and head nurse's perceptions of health care were not compatible. The trainees were being used as change agents in the health care system. Being the weakest link in the network they tried to comply with the training system and with the hospital system. Separating the two became a condition for survival.

In this respect, emerging concepts of organizational learning and the learning organization have taken over the loose ends of failing training traditions. Argyris and Schön introduced the underlying mechanisms of learning in an organizational context and described phenomena such as single loop and double loop learning (Argyris, 1986; Argyris & Schön, 1978). Specific aspects that concern transfer problems may be explained through characteristics of skilled incompetence and organizational defences (Argyris, 1986, 1990, 1991). Garrat (1987), Garvin (1993), Senge (1990), Swieringa and Wierdsma (1989), and Pedler, Burgyonge & Boydell (1991), elaborated on the concepts of Argyris and Schön but mainly addressed managers. Van der Zee (1993) related many of these insights to the practice of development consultants and learning specialists. The idea of the learning organization was a foremost off spring of the quality improvement movement. Total quality projects demanded a fundamental change in attitude and skills of managers and employees. Deming (McLagan, 1991), who may be considered the godfather of the quality movement, derived the interventions needed for that transformation directly from Dewey, who was Shewart's (his tutor's) master. What

is now known as the Deming cycle (plan, do, check, act) bears great similarity to Dewey's learning cycle and Kolb's experiential learning (Kolb, 1984; Kessels & Smit, 1992). The quality improvement movement stimulated the awareness that managers have to fulfil an important educational function in implementing desired changes in the work environment.

The concept of external curriculum consistency in corporate education provides a perspective whereby performance improvement can not be separated from learning, and whereby the management function cannot be separated from the educational function. In striving for external consistency, potential transfer problems are the object of analysis during the needs assessment phase, which leads to compatibility of instructional strategies, learning activities and organizational conditions. The transition of skills into performance is part of the implementation of the wider educational system.

Though external consistency is vital for the quality of a curriculum, the mechanisms that produce external consistency can probably not be pursued via a single programme or course design. A long term strategy of which the governing principles are anchored in a corporate education policy, aligned with the organization's overall mission, policy and strategies, is to be exercised.

2.4 The relationship between external and internal curriculum consistency

After exploring characteristics of the curriculum typology, such as the external consistency of the intermediate curricula and the internal consistency of the formal curriculum, the question should be raised as to whether they are interrelated, and if so, how they influence each other.

In theory, it is possible that a perfect, internally consistent formal curriculum was designed, but that this design took place in complete isolation from the trainees' work environment and without any involvement by management or representatives of the target group. The examples that illustrated the previous section may have shown internally consistent curricula. The instructional objectives contained skills (A: approaching clients, B: writing in a less formal way, C: approaching patients in a holistic way) that were consistent with the developer's perception of the problem to be solved and the desired changes in

performance. The training interventions were consistent with these objectives: they offered learning experiences by which the trainees acquired the new skills. Lack of external consistency in the three cases is held responsible for a poor overall curriculum consistency and thus for low quality.

The theory of curriculum consistency also allows the possible occurrence of a strong external consistency and simultaneously of a weak formal curriculum. When managers, supervisors and employees have a clear, shared vision of the desired organizational outcomes, work environment, performance and skills, and are supported by a coherent system of recruiting, selection, appraisal and rewards, the learning experiences in the social context of the workplace will be so powerful that the ideal and attained curriculum will be congruent, in spite of a weak and internally inconsistent formal curriculum. Specifically when managers and supervisors assume the trainer's role and when the training environment bears great similarity to the work environment, incompatibilities within the formal curriculum are probably compensated.

These considerations lead to the following assumptions:

1. The formal curriculum, whether it is internally consistent or not, has little impact on the quality of corporate education as long as it is not embedded in a chain of externally consistent curricula.

2. The design, development and implementation process of a formal curriculum, however, incorporates many opportunities for enhancing external consistency.

These assumptions carry important implications for design and development of instructional systems. The following chapter attempts to elaborate on these implications.

3 CURRICULUM DESIGN

In the previous sections a typology has been developed wherein quality of corporate education is conceived of as consistency between ideal and attained curriculum. It is argued that quality largely depends on both internal consistency within the formal curriculum and external consistency between the intermediate curricula. According to these assumptions, the aim of curriculum design is to provide a curriculum that meets the demands for both internal and external consistency. Aiming at curriculum consistency, the question arises as to how to achieve that goal?

3.1 ISD-Models

Since they were initiated by the armed forces in the late sixties and early 1970's, systematic models for developing instructional systems, varying in their degree of rigorousness have been produced. Two of the first and best known are the IPSD model (Interservices Procedures for Instructional Systems Development - Branson, Rayner, Cox, Furman, King, & Hannum, 1975; Branson & Grow 1987; Schulz, 1979), and Tracey's Systems Analysis, Development and Validation Model (Tracey, 1971, 1984). Many were to follow. Overviews of Instructional Systems Development models (ISD-models) are presented amongst others by Adrews and Goodson (1980), who identified and analyzed over 40 models and their communalities. Plomp (1982) and Nijhof (1983) studied a number of design approaches that form the basis of an academic research programme in the field of curriculum technology. Kessels and Smit (1985), Schiffman (1986), Mulder and Pieters (1992) and Patrick (1992) highlighted specific features and purposes of various models in their overviews. Most models share the stages of analysis, design, development, implementation and control. In that respect they conform to a general systems approach where components in the system are considered in relation to each other in an orderly but flexible sequence of processes (Briggs, 1977). Theoretical underpinning of design models seems sparse, as Andrews & Goodson (1980) and Nijhof (1993b) argue. Nijhof concludes that there is a continuous proliferation of design models, whereas almost no evolution of models can be perceived. Almost no research exists on the overall effect, or on the cost-effect and the cost-benefit ratio of such models. Therefore, curriculum technology should still be con-

sidered as craftsmanship in the management of knowledge, people and instructional materials for creating products that evoke learning processes with well defined effects. Curriculum technology should not be judged by its theoretical validity, but by its practicality and its effect (Nijhof, 1993b). Lowyck asserts that instructional development is a highly sophisticated endeavour and its quality depends upon the theoretical value of the design model and on the 'intelligence' of the instructional designer (Lowyck, 1991). Thus, for the time being, it probably is the person of the designer that has the greatest bearing on the effects of curriculum design and not the model. Andrews and Goodson presume that educators, and specifically those who strongly advocate discovery learning, might reject a systematic approach in which objectives are specified that match the instructional events. Instructional materials are prepared on the basis of intuition, folklore or experience (Andrews & Goodson, 1980).

3.2 Customized ISD-models

In large-scale organizations with numerous training staff in particular, many models have been developed to implement a more uniform approach to developing training courses. A systematic model with techniques and procedures linked to the successive stages made planning and control easier. Some organizations even hoped that laypersons, unfamiliar with training, could generate training courses by using a fully proceduralized model. In that attempt, problems have surfaced. Though the "what to do" may remain relatively constant across training design, the "how to do it" varies enormously. The need for specific support gave rise to the development of computer aided design devices (Kessels, 1992; Schrijvers & Rosendaal, 1990; Schulz, 1979). Taking into account that in general developers are rather self-willed, the COCOS-computer aided training design system, developed by Rosendaal and Schrijvers (1990), presents itself as a toolbox and does not impose strict procedures. It also offers developers the opportunity to add to the system successful procedures and approaches for specific problems that can be used by colleagues in future projects. So, the ISD-system becomes an expanding data-base of experiences.

Developers consider their work a highly creative job in a complex environment that is constantly offering new problems to solve. Slavishly following an idealised, linear, top-down sequence is perceived as very much against the grain of their profession. In that respect, Pieters (1992a) observes that the design process often exhibits quasi-random

procedures. Some even occur simultaneously: curriculum design as a process of double iterative, parallel processing.

Therefore, developers should actually be encouraged to make up their own models. It is likely to be the only model that they will ever use. Making up your own model is a very stimulating activity. Inherently, developers will use elements of existing models within the frame-work of the systems approach. Often the new model is customized and adapted to the culture of the organization. Various illustrations can be offered: The ISD-model of Fokker Aircraft is influenced by the systems approach in designing aircrafts (FOOM, Roozemond, 1987). The ISD-models of Cap Gemini Pandata (Van Haarlem, 1989) and Volmac (Volmac, 1990) - companies active in the computer business - bear great similarity to the Systems Development Methodologies (SDM) used in the design of data processing systems. Dutch Railways adapted their ISD-model to the principles of contract management currently being implemented organization-wide (Kruijd, Luiken & van der Meer, 1989). SATE, an IBM-ISD-model, is similar to processes used for the introduction of new products (De Potter, 1991). Veersma (1991) developed SOM, an ISD-model for GAK (corporation charged with the implementation of the social security system). This model fits in with overall strategies towards decentralization and project management. Though this proliferation is criticized, most customized models remain instances of the generic model from which they were adapted (Branson & Grow, 1987).

3.3 Design approaches for gaining curriculum consistency

Curriculum design should result in both an internally consistent formal curriculum and in externally consistent intermediate curricula. The construction of an internally consistent formal curriculum involves a rigorous logic that interrelates needs assessment, job and task analysis, instructional objectives, instruction plans and guides, and appropriate evaluation criteria and assessment instruments for the equivalent outcome levels. The formal curriculum requires a *systematic approach* that comprises various cycles of analysis, interpretation and construction. External consistency, indispensable for successful implementation and for the prevention of transfer problems, requires awareness, involvement and consensus of the various actors during the design, development and implementation phases. External consistency is established by a *relational approach* that applies energy, commitment, power and influence of sponsors and participants.

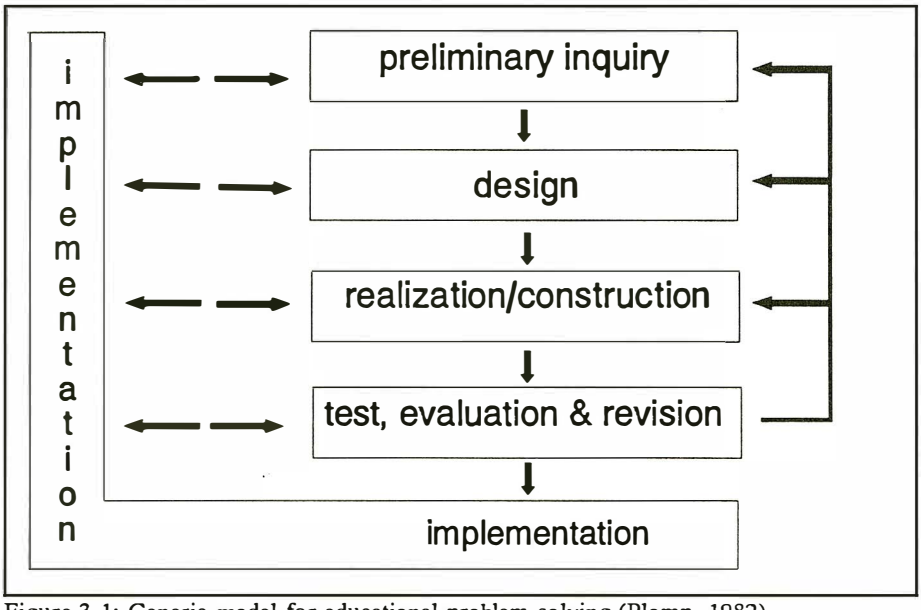


Figure 3-1: Generic model for educational problem solving (Plomp, 1982)

The systematic and relational approaches are supported by the generic model for educational systems development by Plomp (1982) (see Figure 3-1). This problem-solving paradigm is similar to the fundamental pattern of earlier ISD-models; the implementation function holds a distinct position. Plomp's model allows a linear as well as an iterative and spiralic sequence, the latter advocated by Banathy (1987). The systematic approach is implied by the succession of analysis, design, construction, test, evaluation and revision elements. The relational approach finds support by a continuous concern for implementation. Implementation is conceived as an ongoing activity that starts at the initial stage of the problem solving process.

Fullan, who defined implementation as 'the process of putting a change into practice' considers clarity (or confusion) about goals and means one of the perennial problems of curriculum change (Fullan, 1982). In his view, two approaches are open to the developer: the fidelity approach that strives for high quality in the developmental stages, and the adaptive approach in which further development must be worked out by individuals and groups who are involved in implementation (Fullan, 1986).

Gay (1986) clearly points out these problems in curriculum development by stating that the essential elements of the curriculum development process involve issues of power, people, procedures and participation:

> 'Curriculum development is a social enterprise. It is a "people process" with all the attending potentialities and obstacles associated with humans engaged in social interactions. The interests, values, ideologies, priorities, role functions, and differentiated responsibilities form the contours of the interactional and dynamic context in which curriculum decisions are made.'
> 'Curriculum development is neither a purely rational and scientifically objective, nor a neatly sequentialized and systematic process.' (Gay, 1986, pp. 471-472).

In this perspective Gay conceives curriculum development as the process, the syntactical structure, the interpersonal dynamics of decision making about instructional planning. Curriculum design is the product, the substantive entity, the end result of the decision-making process. In his opinion, curriculum development does not necessarily precede curriculum design. Instead, the two enterprises overlap and occur conjunctively (Gay, 1986).

Fullan's fidelity and adaptive approach, as well as Gay's distinctions between the development *process* and the design *product,* support the integration of a systematic and relational approach which is advocated in this study. However, most ISD-models emphasise unidirectional application of the systematic approach and the concern for internal consistency prevails. Though claimed to be vital for successful programme implementation, external consistency and the related relational approach do not receive much explicit attention.

In the following sections the systematic approach and the relational approach are elaborated upon before deriving hypotheses for further research.

4 A SYSTEMATIC APPROACH

The systematic approach implies a logical succession of analysis, design, construction, test, revision, and implementation. This chapter examines theoretical foundations of systems design procedures (Section 4.1). It focuses on the consistency among the elements of the formal curriculum (Section 4.2), and identifies the competencies required for successful application of the systematic approach (Section 4.3).

4.1 A theory of instructional design

Reigeluth (1983) provides a theoretical underpinning of the instructional design process (see Figure 4-1). The confrontation of conditions and desired outcomes (2) determines the selection and application of methods for attaining these outcomes. Reigeluth distinguishes instructional-design theories that focus on methods of instruction, and learning theories that focus on the learning process. Crucial is Reigeluth's distinction between instructional *design* models and instructional *development* models. The former indicates the '*what*', i.e. what the instruction should be like, whereas development models describe the '*how*', i.e. the steps developers should follow in order to make the instruction. Furthermore, the differentiation between descriptive and prescriptive theories is of importance for this study. Descriptive theories take sets of conditions and methods as starting points and describe how outcomes, as the variables of interest, are obtained. In contrast, prescriptive theories use sets of conditions and desired outcomes as given and prescribe the best methods as the variables of interest (Reigeluth, 1983). A descriptive instructional theory is meant to identify specific types of treatments that can, under specific types of conditions, bring about specific types of changes in performance (Gropper, 1983).

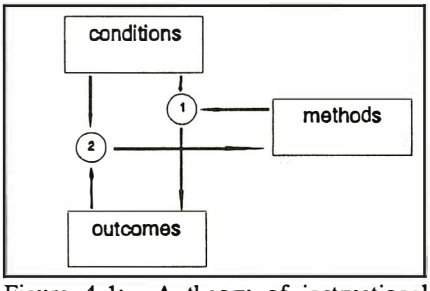


Figure 4-1: A theory of instructional design (Reigeluth, 1983)

When applying these meta-theoretical postulates to our study, it aims at

contributing to *prescriptive instructional-design* and *development theory*, and should produce knowledge about instructional procedures. Consistent with Reigeluth's nomenclature, this study focuses on *design*-theory as concerned with understanding, improving and applying methods of drawing *blue-prints* of instruction, and on *development*-theory as concerned with understanding, improving and applying methods of *creating* such instruction. Furthermore, this study aims at *prescriptive* models for corporate education, as it seeks to create optimal instructional environments directed towards desired outcomes within the framework of the specific conditions of an organization.

Moreover, ISD-models claim to adhere to such design and development-theories. However, empirical evidence is rarely inferred, the lack of which they are often criticised for (Nijhof, 1993b). ISD-models should describe, explain or predict elements in their referent system. Although the *systemic* approach is an inquiry and a discipline, complete with theoretical underpinnings and a developed methodology, many of the *systematic* ISD-models represent a series of mechanical or linear steps rather than the complex and rigorous analytical and cybernetic process required for effective applications of the general systems theory. (Andrews & Goodson, 1980).

Application of the systems theory to instructional development implies the following characteristics:

- A logical process is used for planning, development, implementation and evaluation.
- Goals are based on an analysis of the environment of the educational system.
- Instructional objectives are stated in observable performance terms.
- Knowledge about the trainees is crucial for the success of the system.
- Considerable attention is paid to the planning of instructional strategies and the selection of media.
- Evaluation is part of the design and revision process.
- Trainees are measured and graded by their ability to achieve desired standards and criteria rather than by comparing one trainee with another (Diamond, 1986; Reiser, 1987).

Plomp's generic model for educational problem solving (Plomp, 1982; see Figure 3-1 in Section 3.3) provides a systems approach for:

- analysing conditions and desired outcomes;
- the design and development of an educational environment in which methods and strategies are selected and applied;
- testing and revision of the system;
- evaluation of the outcomes (not to be confused with the specific meaning of the term outcome as denoted by Kaufman [1982] as impact on the organization and society).

This generic model involves a process of iterative problem solving and solution finding. Each following phase in the process may require further analysis of components from previous steps (Feteris, Verhagen & Plomp, 1992). This cyclic nature is required not because of the lack of prescriptive theory, but due to the fact that activities and products in the succeeding stages require specific information that can not be collected in the initial phase. This argument for continuous analysis during the design and development process is also emphasized by Kessels and Smit (in press), who as a result consider evaluation the ultimate appearance of task analysis and needs assessment.

When applying Reigeluth's instructional paradigm and Plomp's problem solving model to the design of the formal curriculum, the activities, as schematized in Figure 4-2, have to be carried out (see also Figure 2-9 in Section 2.2.5).

1. Analysis of goals and/or problems on organizational level requires needs assessment for defining the aims of the problem solving process and for determining the educational and non educational implications of the projected solution (analysis of outcomes and conditions). This type of analysis produces the overall goals of the project and the criteria for evaluating future impact on the organization (Kessels & Smit, 1989b; Kaufman, 1982, 1990; Lamers & Thijssen, 1992; Pieters, 1991, 1992; Rossett, 1992).

2. Analysis of the desired changes in the work environment requires job and task analysis for determining the educational and non educational components and interventions. Analysis may include traditional hierarchical task analysis (breaking up tasks into sub tasks) and psychological analysis (revealing cognitive and metacognitive operations and knowledge representation) (Carlisle, 1986; Kessels, 1986; Kessels & Smit, in press; Mager & Pipe, 1984; Merrill, 1987; Patrick, 1991, 1992; Rossett, 1987).

Analysis of the desired work environment also includes determination of the various target groups and data collection on their specific characteristics. This type of analysis produces specific goals of the project, types of interventions, and the basis for stating instructional objectives and criteria for evaluation on performance level (analysis of outcomes and conditions).

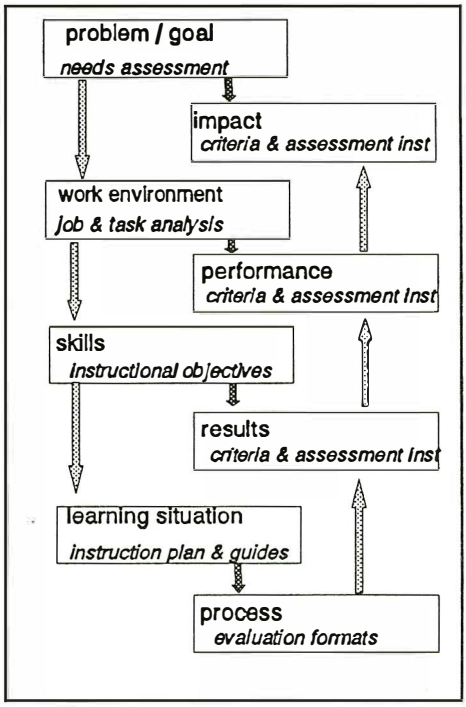


Figure 4-2: Design of the formal curriculum

3. Analysis of the required skills and the transformation of these requirements into instructional objectives, demands for in-depth examination of collected data in order to state educational outcomes in terms of cognitive skills, interactive skills, reactive skills and psycho-motor skills (Kessels & Smit, 1991; Mager, 1962; Romiszowski, 1981). These categories of skills provide the criteria for evaluation on the level of training results and for selecting instructional methods and strategies (analysis of outcomes).

4. The design of learning situations and the development of supporting materials require careful consideration as regards general training strategies and specific methods. The selection is based on instructional theory and on learning theory. Theories that provide information on the effectiveness and efficiency of instructional strategies, methods and delivery systems, respectively information on adequate learning processes and ways learning may be enhanced, induced or controlled (Fleming & Levie, 1978; Lowijck, 1991; Reigeluth, 1983, 1987; Reigeluth & Curtis, 1987; Romiszowski, 1981, 1984).

The development of materials requires subject matter expertise, content analysis and organizing principles of instructional sequencing. These design and development activities produce instructional plans, materials and guides for creating learning situations both in work environment settings and in dedicated training settings.

5. Evaluation on process level requires procedures, instructions and formats for collecting data on reactions of trainees, trainers and other actors in the learning situations to be created. Procedures for formative purposes, pilot testing and revising and for more permanent control of learning processes during the project (Kirkpatrick, 1975; Stake, 1973; Stufflebeam, 1971; Thijssen, 1989).

6. Evaluation on results level requires assessment instruments for collecting data on the progression in skills acquisition. Instruments that provide a demonstration of proficiency referenced by criteria derived from instructional objectives (evaluation of outcomes) (Cras, 1992; Kirkpatrick 1975; Robinson & Robinson, 1989; Schramade, 1989; Tillema, 1993).
Furthermore cost-effective analysis on training approaches is conducted (Kearsley, 1982; Kessels & Smit, 1989a; Nijhof, Mulder & Van Wijk, 1992).

7. Evaluation on performance level requires assessment instruments for collecting data on changes in the work environment, referenced by criteria derived from project objectives (Keursten, 1992; Kirkpatrick, 1975; Robinson & Robinson, 1989; Seashore, 1983)

8. Evaluation on impact level requires instruments for assessing organizational change. Methods for data collection on progression in achieving project goals and solving related problems. (Kirkpatrick, 1975; Robinson & Robinson, 1989; Seashore, Lawler, Mirvis & Cammann, 1983).

4.2 Assessing the systematic approach.

The constituent systems elements of the formal curriculum have been described by their function and products as well as by the manner in which they are interrelated. For practical use, these elements have been provided with procedures, methods and techniques described in Part III: The Design Standards.

For reasons of curriculum research it is necessary to assess the formal curriculum. Stake constructed a fundamental model for evaluation, representing the processing of curricular data (Stake, 1973). (Stake's paradigm was adopted in the previous section on curriculum consistency.) Evaluation should be directed towards describing *congruence* between what was intended and what is observed. Furthermore, *contingencies*

should be examined between antecedents (conditions), transactions (educational encounters), and outcomes (Stake, 1973). When applied to the formal curriculum (what the developer intends), assessment of the *logic* contingencies between its systems elements is required (Figure 4-3). Assessment of the attained curriculum (what can be observed) involves inquiry of the *empirical* contingencies between these elements. Judging curriculum quality is judging the *congruencies* between formal and assessed curriculum. The systematic approach is geared towards logic contingencies in the formal curriculum, aiming at internal consistency.

Examination of the contingencies in the formal curriculum is an important strategy for assessing whether a systematic approach has been accomplished by the developer or the development team. The Instructional Quality Profile (Merrill, Reigeluth & Faust, 1979) offers such a strategy. The curriculum elements should be judged by their adequacy and consistency. The Instructional Quality Profile focuses on the following interrelated elements: purpose, objectives, tests and instruction. Applying their approach to the formal curriculum, as analysed above, the evaluation of adequacy and consistency should be represented as shown in Figure 4-3.

The formal curriculum can be assessed by examining the adequacy of the products in 1 to 8 and the consistency of their relations in 9 to 18. However, for assessing the degree to which a systematic approach has been accomplished, the previous reasoning needs some modification. Conducting needs assessment and task analysis in particular require, a systematic approach, as well as a relational approach; whereas stating objectives, constructing evaluation instruments and writing instructional materials may be completed in full isolation.

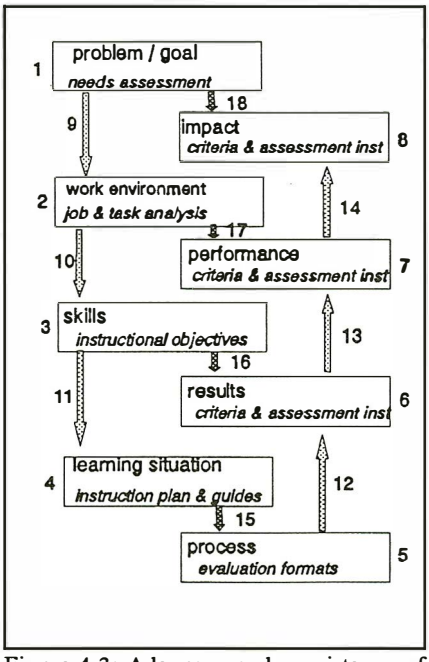


Figure 4-3: Adequacy and consistency of the formal curriculum.

Therefore, judgements of the systematic and relational approach, based on the products of the formal curriculum will be found to be confounded where the initial stages of

analysis are concerned (see Section 5.2: The relational approach to the formal curriculum).

4.3 Competencies for a systematic approach

It is stated that theoretical validity of design models is scarce (Nijhof, 1993b), and that consequently their effectiveness largely depends on the developer's craftsmanship. The profession of curriculum design and development requires specific competencies. They have been the object of study since the 1930s, ranging from adult learning as a sort of charity given to the underprivileged, to formulating guidelines for developing a graduate programme for training adult educators, and from criticizing excessive reductionism and behaviourist foundations to recent statements on ethical standards. Henschke's review (1991) reports on 30 of these studies.

ASTD (McLagan, 1983, 1989) and The International Board of Standards for Training, Performance and Instruction, IBSPI (Foshay, Silber, & Westgaard, 1986) conducted large-scale research projects on design and development competencies. ASTD reports on 11 roles, their outputs, the required competencies and related ethical issues. The IBSPI Standards describe sixteen instructional design competencies, each embedded in a rationale, performance indicators and assumptions. Rothwell and Kazanas (1992) based their book 'Mastering the instructional design process. A systematic approach' entirely on the sixteen IBSPI-instructional design competencies, and claim to offer the first volume grounded on an underlying foundation of solid research (Rothwell & Kazanas, 1992). Tracey (1981) developed a 600 page self-evaluation manual for HRD managers and specialists. Part Five of this giant checklist is devoted to the development, implementation and evaluation of HRD delivery systems.

To accomplish a systematic approach in curriculum design, as advocated in the previous sections, a selection of competencies from the above mentioned sources has been made. This selection is justified by the requirements of an adequate performance of the elements in Figure 4-3. The numbers refer to the specific components and their contingencies.

Conduct needs assessment (Figure 4-3: 1)

> Identify ideal and actual performance and performance conditions and determine causes of discrepancies. Employ strategies for analysing individual and organization behaviour.

Perform job and task analysis (Figure 4-3: 2 and 9)

Employ analysis strategies and reporting procedures.

State instructional objectives (Figure 4-3: 3 and 10)

Transform job requirements into objectives, so that performance measurement and selection of instructional strategies is facilitated.

Develop performance measurements (Figure 4-3: 6 and 16, 7 and 17, 8 and 18)

Transform needs, performance requirements and objectives into evaluation criteria and appropriate assessment instruments.

Sequence the performance objectives (Figure 4-3: 4 and 11)

Draw a blue-print for the desired learning environment, appropriate for achieving the desired changes of performance.

Specify the instructional strategies (Figure 4-3: 4 and 11)

Devise instructional interventions to put the blue-print learning environment into action.

Design instructional material (Figure 4-3: 4 and 11)

Develop print, audio-visual or electronic-based learner materials, job aids, trainer guides and plans to facilitate the instructional interventions.

Evaluate the educational interventions (Figure 4-3: 5, 15 and 12)

Appraise the instructional methods, sequences and materials, and improve.

The following generic competencies are considered to be prerequisites:

- Business understanding (Figure 4-3: 1, 8 and 18)
- Adult learning understanding (Figure 4-3: 2,3,4, and 10,11)
- Intellectual versatility (Figure 4-3: all components, 9 to 18 in particular)
- Information search skill
  (Figure 4-3: all components, 1 to 4 and 5 to 8 in particular)
- Questioning skill (Figure 4-3: 1 and 2 in particular)
- Writing skills (Figure 4-3: 1 to 8 in particular)

In a training programme for curriculum developers, these competencies should be addressed.

5 A RELATIONAL APPROACH

In the preceding sections it is argued that external curriculum consistency (consistency between the intermediate curricula: intended, formal, perceived and operational) can be influenced by the relational approach of the developer. As curriculum affairs are mainly activities involving human beings communicating with each other, the relational approach consists of all the contacts between the developers and relevant actors. Besides the actors referred to in the curriculum typology ([top]managers, supervisors, trainers, trainees, developers), other parties may be involved, in particular clients, customers, coordinators, sponsors, opinion leaders. Unlike the systematic approach with its clear and rigorous logic, the relational approach may often seem fuzzy, using informal networks, balancing power and influence, and striving for consensus within the limits of culturally determined feasibility (Duncan & Powers, 1992). Political awareness, cultivating support, developing relationships and gaining visibility seem to be ingredients of this aspect of curriculum design (Warshauer, 1988). Activities that belong to the relational approach are sometimes characterized as "walk and talk the job" (Harrison, 1992). Banathy (1987) states that the process of arriving at better decisions is not a process of optimization; it is rather a process of negotiation among those with different points of view and value systems in order to find a satisfying solution. Subsequently, he advocates a participative design approach, comprising several spiralic and iterative phases that pay attention to context and environment of the system (Banathy, 1987; p. 93).

Although chaotic design processes may produce apparently high quality programmes, for reasons of efficiency, planning and control a more orderly application of the relational approach is to be recommended (Lippitt & Lippitt, 1986; Phillips & Shaw, 1989).

The relational approach refers to the developer's activities in the domain of interpersonal dynamics of decision making about educational planning. It aims at homogeneous notions among actors on what the problem is, how it should be solved, and at gaining their commitment, involvement and support for implementation. In the next sections, several tactics to help achieve these goals are discussed. Highlighted are project management, rapport-building activities during needs assessment and task

analysis, involvement of line management, creating similarity between learning situation and work environment, and recruiting trainers with practical experience in the subject matter field.

5.1 Project management

Project management is a widely accepted form of planning and control. Sometimes it is seen as an administrative process of allocating resources, monitoring costs and ensuring conformity to time lines and specifications. Sometimes it is seen as an interpersonal process that manages relationships through such actions as making sure the right people are involved in the right way, and adopting a style that conforms to the need or preferences of the people involved (Jackson & Addison, 1992).

Project management facilitates the various design and development phases of the general problem solving model (Pieters & Mulder, 1992; Van de Wolde, 1992). Project management is important not only for planning and control reasons, but also for disseminating innovative ideas on corporate education in general and programme features in particular among important stakeholders. In many organizations project management is an accepted strategy, if not a *sine qua non*, for research, development and marketing activities. Therefore, it is recommended for educational programme design that a strategy similar to the one the organization is acquainted with is adopted. In that respect similar notions apply to project management as previously have been made on the customized ISD-models.

Common project functions comprise planning, scheduling and control (Rothwell & Kazanas, 1992), and will recur during the different phases of a project. Although labels may differ, phases referred to here comprise: Preliminary inquiry, Design, Construction, Test & Revision, and Implementation and are derived from the generic problem-solving model (Plomp, 1982).

- Preliminary inquiry involves recruitment of a project leader, assigning the role of principal to one or more executives constituting a project team, needs assessment, stating goals and planning of activities and resources.
- Design involves task analysis, stating objectives and evaluation criteria, blueprinting the learning environment.
- Construction involves selection of trainers and coaches, devising instructional strategies, development of supporting materials and

delivery system.

- Test & Revision involve pilot testing, formative evaluation, and revision.
- Implementation involves delivery and assessing effects, evaluation of evolving needs and adaptation of the instructional and delivery system.

(See Part III: The Design Standards, for an extended description of project management)

In perspective of the relational approach, project management and the processes it evokes can be regarded as a most important learning process for the organization. Particularly organizations that consider training an isolated activity to be delegated to the training department or contracted out to a commercial agency, may benefit from the intrinsically educational values of project management. The developer, in the project leader's role, is offered many chances to inform participants on contingencies across needs, interventions and outcomes. Essential conditions for successful programme implementation and their implications need to be discussed extensively. Apart from the education policy-making process on corporate level, project management is a foremost opportunity to convey that, though an organization may farm out the training process, the learning process ultimately has to take place in the work environment.

5.2 The relational approach to the formal curriculum

Some elements in the formal curriculum do not depend exclusively on a systematic approach and require a relational approach as well. Needs assessment and task analysis need to be mentioned specifically. Mostly, where management has commissioned **a** training programme, the initial problem has already been perceived as a training problem. Subsequently, the developer introduces needs assessment in order to reconsider these assumptions. Whether management is prepared to support the upheaval of time consuming needs assessment depends largely on the image of the training function in general and on the credibility of the developer in particular. Turning needs assessment and task analysis into a model of action research (Van der Vegt, 1974) requires consulting skills from the developer, so that he or she may adequately play the role of change agent. Activities of such nature require other competencies from the developer over and above mere skilful application of data collection techniques and logic reasoning.

Moreover, task analysis is not just a meticulous process of determining how things are done and should be done. It is also establishing a rapport, thus evoking critical, though often unconscious, know-how. The positive and non-threatening climate during the data collection process is of great value regarding the quality of the information sought (Kessels & Smit, in press). The nature of the established relationships with management, employees and clients during needs assessment and task analysis are of preeminent importance for successful implementation, which starts here, right from the initial phase of the development process.

5.3 Compensatory quality of the relational approach.

As mentioned previously, many educational programmes have been conducted without any formal assignment. Others have been developed because the training staff anticipated a demand for such programmes, without having first clearly analyzed any perceived problem. Education departments and commercial training agencies may offer training programmes of a certain kind because these are fashionable at the time. In many cases the formal curriculum is absent. Numerous training programmes are not based on an elaborate formal curriculum. Except for the few lines in a flyer or programme catalogue and some transparencies, documentation is sparse. The programme is in the trainer's head. However, these training activities can be still perceived as high quality programmes, even when formal evaluation did not take place. Missing or poorly stated formal curricula will by their nature cause internal curriculum discrepancies. However, these discrepancies will not inevitably cause a decrease in quality. Certain factors might compensate for these discrepancies. We are hypothesizing that the relational approach bears such correcting qualities. The following sections reflect on the relational approach in conjunction with some factors that are assumed to influence quality in corporate education: the role of line management, similarity between learning environment and work environment, practical experience of the trainer, and the selection of trainees. Although we contend that weaknesses in the formal curriculum might be compensated for, the relational approach does not substitute for the formal curriculum. Nonetheless, the factors described here are of critical importance for attaining positive programme results.

A decisive factor that is not discussed here is the trainee. Prerequisite competencies and motivation are distinct characteristics that matter. Curiosity, desire for competence, aspiration to emulate an attractive

model and commitment to social reciprocity, as analyzed in depth by Bruner (1966), should be considered too, particularly as they are directly influenced by the factors dealt with here. According to Jarvis (1987), learning should be regarded as a social phenomenon, in which the learning process is primarily tied to the learner. Learning is about becoming a person in society, about transforming the experiences of living into knowledge, skills and attitudes so that human individuality might develop. Learning is also about adapting and becoming a conforming member of an organization (Jarvis, 1992). Potential discrepancies between what the trainer or programme intends and what happens inside the learner is most significant for the desired outcome (Watkins & Willis, 1991).

5.3.1 Line management involvement

Several authors have made assumptions on the relationship between management involvement and successful programme implementation (Chalofsky & Reinhart, 1988; Nadler & Nadler, 1992; Robinson & Robinson, 1989). Moreover, what the driving mechanisms are that might compensate for poor programme design is rarely analysed. The following reasoning may offer a plausible explanation. Line managers have a strong interest in the development of the abilities of the employees for whom they bear immediate responsibility. The training and development of necessary skills is of major importance for achieving the department's objectives and targets. Line managers who are aware of the close link between the skills of their employees and the output of their department will also use training as a management tool which enables them to create a better performance. Line managers with this view on human resources will see to it that they send their employees on training courses that match their departmental needs. This interest in programmes that focus on performance will result in the line manager's involvement in design, implementation and local follow up. These line managers will redirect a poor formal curriculum in such a way that their departments will benefit from the training programme. If the trainer has little experience with the specific job requirements, these managers will not hesitate to offer help, to allow experienced employees or even themselves to play a key role in the training programme. Trainees who work with such involved managers and supervisors will be encouraged and coached while integrating the newly acquired skills in their work environment. These managers will be positive role models and will eradicate most of the highest barriers to skill transfer. Thus, the involvement of line managers and supervisors will lead to job and skill oriented training programmes and subsequently

remove barriers to skill transfer.

This is how it could work, but in reality management involvement is difficult to establish. In his recent research project on the developments in human resource management in 40 British companies, Storey (1992) reveals that management support for education is poorly developed. The problem of lack of human resource development even tends to reproduce itself:

> 'Managers who have themselves received little education and training are less likely to recognize or approve the need for investment in the training of their subordinates' (Storey, 1992, p. 213).
>
> 'Also noteworthy is that even in the most sophisticated of cases where the training function was riding high and perhaps even enjoying a reputation extending beyond the organization's boundaries, there were typically large segments of the organization's managers who remained largely untouched by the paper provision' (Storey, 1992, p. 210).

During our own research project we also received letters from training officers describing how even when senior managers presented a coherent, sophisticated training policy, it was often experienced rather differently by middle-level managers and shopfloor workers. The more visible messages of cost-cutting and pressure had a greater impact on the day to day practice of education than corporate policies.

Mumford (1984) analyzed the local managers' role in helping their subordinates learn. Important elements in the management function are appraisal of performance and potential, analysis of development needs, recognition and facilitation of opportunities, and the determination of priorities including allocating their own time to the learning process. The manager's personal role embraces elements such as establishing learning goals, accepting risks in subordinates' performance, monitoring learning achievement, providing feedback on performance, acting as a role model, and providing direct coaching.

Recently Nadler & Nadler (1992) and Carr (1992) published books that are presented as managers' guides to training and development. There is no doubt that the manager and supervisor are being recognized as important educators.

Crucial in the relational approach and essential for the success of a programme, is the development of a strategic partnership (Robinson & Robinson, 1989). In this partnership between developer and line managers, awareness grows of the close link between skills of employees and

the output of their department. Such a partnership increases awareness of favourable and unfavourable conditions for implementing the desired changes.

5.3.2 Similarity between the learning situation and work environment

The main characteristic of the ideal curriculum in corporate education is the focus on performance and on the acquisition of the necessary skills. Besides creating learning situations that facilitate this acquisition of skills, great emphasis should be placed on removing barriers to skill transfer (transfer here conceived of as the transition of skills into performance, see paragraph 2.3). When trainers manage to create learning situations that mirror the work environment, the demand for focus on performance and on skills is fulfilled. When the learning situations are created in the actual workplace, and trainers and local managers cooperate in conducting the programme, the risk of raising barriers to skill transfer will be lowered. This is not a plea per se for on the job training, but to point out the importance of the relationship between learning and work environment. However, it is crucial that those cognitive operations that are required of the employee in his or her workplace be the object of the programme. A learning situation that demands that the trainee solve problems identical to those in the workplace bears in itself the characteristics of job orientation and focus on skills.

Crucial in the relational approach is that the developer is fully acquainted with the work environment of the trainees. Frequent contacts and unlimited access are indispensable for arranging learning opportunities as described above. Collecting critical incidents, drawing case histories based on recent experiences and simulation of tasks from the work environment may compensate for poor application of instructional and learning theories.

5.3.3 Practical experience of the trainer

In the context of corporate education, practical experience in the subject matter field suggests that the trainer has previously held jobs similar to the one for which he or she is now teaching. This means e.g. that the trainer has recently been working in the field of sales, chemical operations, nursing, micro electronics, management, etc. if teaching the

corresponding subject matter. This practical experience will have several positive effects on the training situation:

a. It will provide the trainer with many examples from everyday life that can be used to illustrate and illuminate difficult concepts, principles, procedures and approaches.

b. Trainees will feel the relevance of what the trainer is offering them, because they recognize reality in the training approach, in the jargon used and in the treatment of themes that are difficult for them.

c. The elements a and b mentioned above will be particularly effective in facilitating the learning process because of its focus on performance and skills. However, there is an additional element: Trainers who have recently experienced the subject matter field they are teaching may still profit from their network of colleagues. This means that they have easy access to the trainees' work environment. In relatively small organizations these trainers may often know their trainees' supervisors and experienced colleagues. In organizing practical training or demonstrations, this network can be of great help. Furthermore, cooperation will be easier to establish between line managers and the trainer, which has a positive effect on the local support the trainee receives while fulfilling practical training assignments such as practising new skills, carrying out research in the workplace or working on special training projects.

Recruiting trainers that have practical experience in the subject matter field may compensate for weaknesses in lesson plans and training materials. By the same token, an internally consistent formal curriculum will not generate valuable learning experiences in the hands of an inexperienced trainer. Paraphrasing Schrag (1992, p. 277): a brilliant music score will sound awkward when interpreted by an inexperienced player of music.

5.3.4 Selecting trainees

In practice, it often happens that employees are sent to a training programme that does not comply with their needs, expectations or personal opinions. Sometimes programmes are compulsory for all employees of a certain department, or for employees who have been working for a certain number of years on a specific salary level. In addition, trainees are sometimes lured into training courses that would otherwise not run

due to insufficient numbers. Even when the target group is initially clearly defined, many occurrences may confound the virtual training group.

Selection of trainees involves various kinds of activities:
a. The interview provides an opportunity to check whether the candidate fits the profile of the target group and whether he or she is motivated and has the prerequisites. The interview should also reveal whether the circumstances in the work environment are favourable for applying the results of the programme. Specifically, the selection assesses whether the factual conditions for this candidate correspond to those agreed upon in the needs assessment phase.
b. If the line manager selects candidates, the developer has an opportunity to brief the manager on the objectives, conditions and the support required. This contact too is an opportunity for breaking imminent transfer barriers.
c. If the trainer selects the candidates, the trainer's instruction should draw attention to the intake elements a and b.

Selection of trainees involves a relational approach that clarifies purpose, prerequisites and conditions to the parties involved. This has a positive effect on the learning process and on the transition of skills into performance.

5.4 Assessing the relational approach

According to the previous sections, research on the relational approach should investigate the following aspects of the curriculum development process:
- the factual contacts with parties involved
- project management strategies
- needs assessment
- job and task analysis
- involvement of line management
- similarity between learning and work environment
- selection and instruction of trainers
- selection of trainees

The effectiveness of these aspects will largely depend on the quality of the educational climate in an organization. Its educational history and its present human resource development policy contribute to that climate.

Personal dedication of top management as well as the reputation of the training staff are informal but important indicators for the climate. Building a positive reputation takes time and can not be achieved through a single programme development project, although a single programme that ends up in jeopardy may cause an unwanted setback. In their handbook of training and development for the public sector Van Wart, Cayer & Cook (1993) devote a chapter on gaining organizational support for training and development programmes. The strategies they suggest include amongst others superior understanding of the basics of the organization, visibility at organizational events, being seen as an integral and dependable part of the organization at large, and making sophisticated presentations to the executive staff as well as adjusting to low-skilled maintenance workers. Finally, they recommend recognizing the formal as well as the informal networks within the organization and cultivating those people who make the decisions about training, whoever they may be (Van Wart *et al.*, 1993, pp. 96-100). It is important to see that the political and social context in which a specific training programme is embedded influences the conditions for successful implementation. The effectiveness of the relational approach is either limited or favoured by this context and educational climate.

5.5 Competencies for a relational approach

The quality of the relational approach is heavily related to the personal effectiveness of the developer. However, the image of the training function and its position in the structure of an organization are the foremost conditions that determine the opportunities for a relational approach within a single project (Buckley & Caple, 1990). Management's acceptance of the developer and the extent to which management legitimizes the developer's role are essential for the problem-solving effort (Lippitt & Lippitt, 1986).

The Coopers & Lybrand report 'A Challenge to Complacency' (1985), comparing approaches to training in British organizations and their European counterparts, offered evidence of a disturbingly low level of investment in training and the widespread failure to perform the function well. The report urged managers and trainers to change their attitudes towards training. These attitudes were characterised as complacent, ill-informed and sceptical of training (Buckley & Caple, 1990; Harrison, 1988, 1992). When these characteristics relate to an organization's education policy and practice, a skilfully applied relational approach of the

developer in a specific project is probably severely hampered by its context.

Status and respect in the eyes of top management, supervisors and operating members are established through prior opportunities to influence and use power. In turn, developers should exhibit high respect for and be thoroughly curious about each person's experience and knowledge, always striving for improvement (Duncan & Powers, 1992; Tracey, 1981). However the developer supports his team, as a project manager he also exerts distinct push and gentle pull as regards the innovations to be achieved (Vandenberghe & Van der Vegt, 1992).

Interpersonal and consulting skills seem to be indispensable for an effective relational approach. Grinwis (1990) describes the consulting process (with top management) as an uninhibited encounter. The consultant plays an authentic but constructive supporting role, a detached and critical, as well as a reflective role.

Many sources offer analyses of competencies professionals should dispose of when they enter into the relational approach. Often the performance oriented corporate educationalist is portrayed as a 'change agent' (Clark, 1991; Phillips & Shaw, 1989; Pont, 1991; Van der Vegt, 1974). When comparing curriculum design with the planned change tradition, the profiles of the change agent may be of great value for the developer (Argyris, 1982; Bennis, Benne & Chin, 1969; Lippitt, Watson & Westley, 1958).

The ASTD-research projects (McLagen, 1983, 1989), as well the IBSTPI-Standards (Foshay *et al.*, 1986), define several competencies for developers that may apply to the relational approach. Furthermore, recent publications on consulting and coaching offer a variety of requirements and competencies for developers to adopt in their relational approach (Block, 1981; Gilley & Eggland, 1989; Lippitt & Lippitt, 1986; Nathans, 1992; Phillips & Shaw, 1989; Rothwell & Kazanas, 1992; Sink, 1992; Smit, 1992; Tosti & Jackson, 1992; Vrakking & Cozijnsen, in press).

The most salient competencies are listed below.

1. Communication skills: listening, observing, interviewing, relating to others and self-expression. Exchanging constructive feedback.

2. Project management skills: leadership and chairperson skills,

planning, monitoring and negotiating skills.

3. Consulting skills: building open collaborative relationships. Clarifying mutual expectations and responsibilities. Ability to influence others and gain commitment.
   Facilitating change: encouraging widespread participation in the design and implementation of a project. Dealing with friction and resistance.

4. Experimental flexibility, self-insight and self-esteem.
   Ability to create an atmosphere of tact, trust, politeness, friendliness and stability.

5.6 Relational approach within a development team

The actors described in this study refer to manager, supervisor, developer, trainer and trainee. The relationship between developer and trainer has been touched upon as a specific source of potential external curriculum inconsistency. The trainer's practical experience in the subject matter field may compensate for a weak formal curriculum (poor developer's work). However, such inconsistency also occurs when the trainer does not enact the developer's high quality blueprint. The latter is being addressed by Van den Akker (1988), though it is unlikely that a highly consistent formal curriculum compensates for poor trainer's performance.

Similar inconsistencies may occur within a development team. Up to this point the development team has been conceived of as a group directed by the developer, and comprising (representatives of) management, supervisors, trainers, trainees, subject matter experts and clients: the development team or project group as a major vehicle for obtaining external consistency.

Moreover, more than one developer might be engaged in large and complex projects. Sometimes the project is subdivided in modules, derived from a master plan. Each developer is responsible for one module, performing all design functions (needs assessment, task analysis, objectives, evaluation criteria and instruments, instructional strategies, materials, trainer guides, etc.). The developer remains responsible for the internal consistency of this single module. The project leader is to monitor consistency among the modules. The consistency referred to here is internal consistency of the formal curriculum.

Corporations and institutions with large training departments sometimes prefer to departmentalize the design process. A training account manager maintains relations with (top) management. The account manager passes on the project to a project leader. The project leader assigns a task analyst. Task analysis reports are sent to the instructional objectives specialist. On the basis of these objectives the instructional designer produces a programme layout, which is passed on to the developer. The developer refines the layout by devising instructional strategies, assisted by art work and media specialists. Often, these fragmented activities take place on different locations.

Though this departmental approach has the advantage of recruiting highly specialized training staff (Branson & Grow, 1987), the sources for inconsistencies are plenty. Crucial is the account manager's role. This role is the only one related to the intended curriculum. Moreover, in self-financing training departments the account manager is charged with the acquisition of profitable contracts. This double-bind relationship may bias needs assessment and outweighs many of the presumed advantages.

A departmentalized design approach is not to be recommended, not only because it is very much against the grain of the creative and artistic characteristics of curriculum design, but also because it is threatening to the consistency theory developed here.

5.7 Relational and systematic approach intertwine

So far the two approaches in curriculum design have been treated as separate entities. The systematic approach effects internal consistency of the formal curriculum; the relational approach generates external consistency across the various appearances of a curriculum (intended, formal, perceived and operational [see Figure 5-1]).

Moreover, internal consistency too is affected by a relational approach: developers should frequently confer with managers, trainers, trainees, clients, subject matter experts and educational specialists, and conceive of these as major sources of information on performance requirements, objectives, instructional strategies, content, etc. Likewise, external consistency is affected by a well documented, internally consistent formal curriculum.

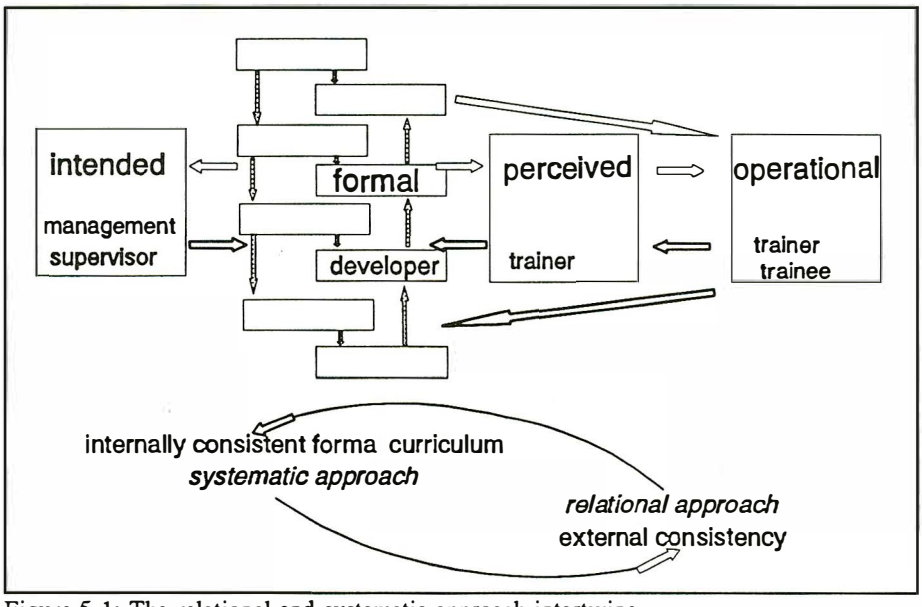


Figure 5-1: The relational and systematic approach intertwine

6 HYPOTHESES

The main goal of this study is to formulate and validate instructions for effective and cost-efficient design, development and implementation of programmes in corporate education. These instructions should enhance the quality of programme results, improve performance, and increase the organizational impact.

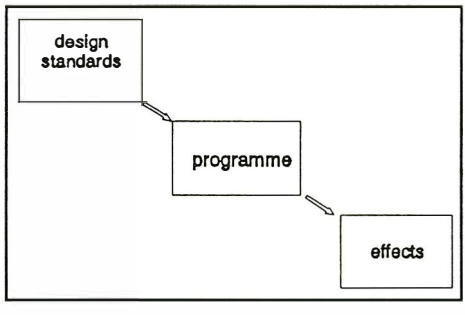
In the preceding chapters we have asserted that overall consistency between the ideal and attained curriculum is theoretically an indicator of quality. Furthermore, we contend that external consistency between intermediate curricula (intended, formal, perceived, and operational), and internal consistency of the formal curriculum in particular, are predictors of overall consistency, thus of programme quality.

Moreover, to achieve internal consistency of the formal curriculum, a systematic approach is advocated, whereas external consistency can be generated through a relational approach. Thus, design standards should comprise instructions for a systematic, as well as for a relational approach. Skilful application of these design standards should result in internal and external curriculum consistency and consequently effective and cost-efficient programmes.

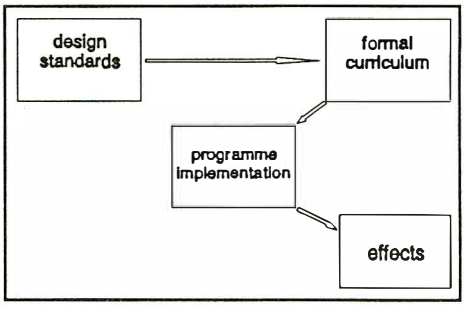
6.1 A chain of reasoning

The assumptions above lead to the following chain of reasoning:

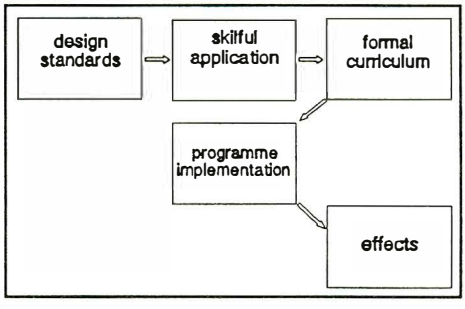
1. Design standards should generate educational programmes that bring about positive effects.



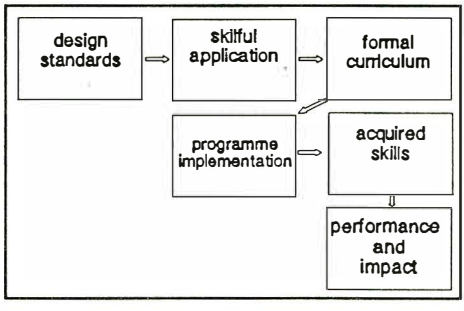
2. Design standards are used to prepare an educational programme (formal curriculum). These preparations result in tools such as plans, materials and guides. The desired effects will be attained following proper implementation of the programme according to plan. The trainer enacts the plan.



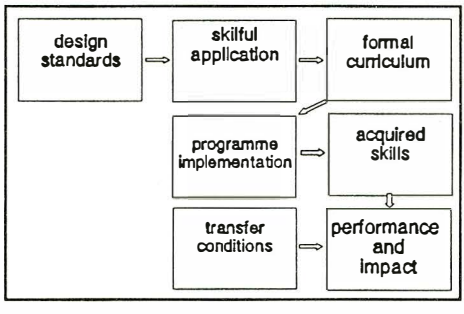
3. Effective design standards require skilful application by the developer. The developer needs to be trained to apply the design standards appropriately.



4. The effects of a programme find expression in the newly acquired skills of the participants. Ultimately, however, improved performance and a contribution to solving the initial problem (impact) are to be seen as positive effects.



5. Transfer of newly acquired skills into improved performance is facilitated or impeded by conditions in the participants' work environment.



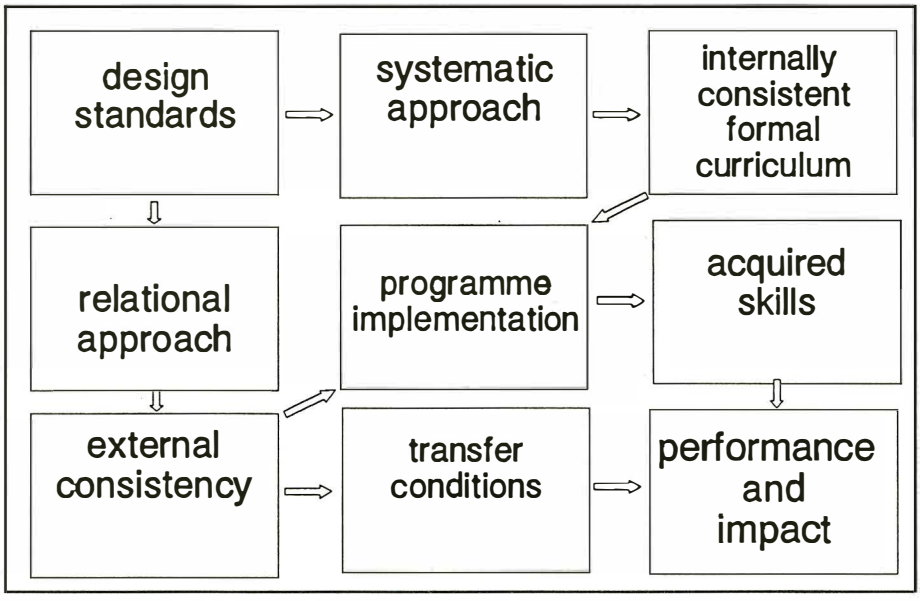


Figure 6-1: A chain of reasoning in corporate education

6. Design standards should stimulate the developer to take both a systematic and a relational approach (Figure 6-1).

a. The systematic approach effects an internally consistent formal curriculum. Therefore, logic contingencies are to be found among purpose, objectives, evaluation criteria and instruments, and instruction presentation. The internal consistency of the formal curriculum enables powerful educational interventions and, subsequently, positive results.

b. The relational approach generates homogeneous notions among parties involved as to what the problem is and how it could be solved: external consistency. If managers, supervisors, trainers, trainees and the developer share coherent opinions about the purpose and about the means to that end, their efforts will lead to successful programme implementation, favourable transfer conditions and positive effects.

6.2 Hypotheses to be tested

The concept of curriculum consistency and the ensuing line of reasoning lead to the following hypotheses to be tested:

1. Skilful application of design standards, based on both systematic and relational approaches, will generate educational programmes that accomplish better results than programmes that are not supported by such approaches.

2. Design standards advocating a systematic approach lead to internally consistent formal curricula.

3. Internal consistency of the formal curriculum and programme effects are related positively.

4. Design standards advocating a relational approach lead to external consistency (homogeneous notions among concerned parties as to the nature of the problem and its possible solution).

5. External consistency and programme effects are related positively.

6. The relational approach compensates for weaknesses in the systematic approach.

7. The systematic approach does not compensate for weaknesses in the relational approach.

Educational provisions should be cost effective. A cost-effective programme design generates the best effects at the lowest costs. As the largest cost factor in corporate education are trainees' salaries and their opportunity costs (the loss of potential contribution to the organization), the programme with the shortest training time per employee is the least costly. But the shortest programme is not necessarily the most effective. Therefore, though conducting cost-benefit analysis is an important aspect of curriculum design, this activity itself does not generate better programme effects. This observation leads to an additional hypothesis:

8. Though cost-benefit analyses are important for selecting efficient solutions to educational problems, they are not related to programme effectiveness.

As the empirical research projects of this study aim at theoretical replication rather than at statistical generalization, rival hypotheses should be stated: hypotheses that explain why, eventually, the evidence of the curriculum consistency theory can not be inferred (Yin, 1989, 1991; Sprinthall, Schmutte & Sirois, 1991). Within the limited scope of this study the role of the trainer offers a basis for two rival hypotheses.

9. The trainer plays a dominant role in the educational process. Thus, the driving force of design standards alone is itself insufficient to determine programme implementation and transfer conditions completely. As a consequence, skilfully applied design standards, irrespective of their systematic and relational quality, do not guarantee positive programme results.

10. This limitation in the power of design standards will be especially obvious when developer and trainer are not the same individual.

These hypotheses will be tested against the empirical findings of the two research projects described in Part II. The results of the analyses obtained from these projects will contribute to the validity of the curriculum consistency theory. If evidence can be inferred regarding the systematic and relational approaches, design standards can be improved on the basis of the empirical findings. Skilful application of such design standards will lead towards high quality educational provisions in labour organizations, which support their constituents in their endeavours to go, to grow and to glow.

PART II: TWO EMPIRICAL STUDIES

INTRODUCTION

The main research questions of this study are:

1. Which factors in curriculum design influence the quality of corporate education?
2. How do these factors operate?
3. Can design standards control these factors?

In Part I, the conceptual framework, a theory on curriculum consistency was developed that culminated in a chain of reasoning reflecting the relationships between design standards, programme implementation, results, and related factors (see Figure 6-1). The conceptual framework, its theoretical underpinning and the chain of reasoning resulted in the hypotheses that are being tested empirically here.

The empirical research consists of four main stages:

a. *17 Case studies*
This study includes the analysis of 17 contrasting cases, of which 8 were considered unsuccessful training programmes and 9 were considered successful (Chapters 7, 8 and 9).

b. *Developing design standards*
The development of design standards is based on both a search of literary sources and the empirical findings of the 17 cases (Chapter 10).

c. *Training the 30 developers*
30 Developers were trained to apply these design standards adequately. The training period lasted 8 months, during which time participants designed and developed educational programmes for their own organizations (Chapter 11).

d. *Analysis of curriculum projects*
Further research was conducted on 28 projects. The curriculum documents of each project were assessed by three judges, who also interviewed the developers. Information on the attained curriculum of 17 of the implemented projects was gathered through questionnaires completed by (top) management, supervisors,

trainers, trainees and the developers. The reliability of the data on effects from 14 projects was suitable for further analysis. The conclusions of this second study provided new material for revising the design standards (Chapters 12, 13 and 14). This revised version is included as Part III.

The empirical part of this study was carried out between August, 1989 and August, 1993. The case studies took place from August, 1989 until August, 1991. Training the curriculum developers lasted from October, 1991 until June, 1992. In June the judges assessed the curriculum documents and interviewed the developers. Implementation of the programmes began in June, 1992. Data collection on programme results took place from November, 1992 until May, 1993. The analyses were completed in July, 1993. Revision of the design standards (Part III) took place in August, 1993.

Each of these research components is described in detail in the following chapters.

7 EMPIRICAL STUDY #1: 17 Case Studies

Hypotheses 1, 2 and 4 in Chapter 6 focus on the effects of skilful application of design standards. For the cases in Study #1, such design standards are not yet available and therefore cannot be applied or tested. The case studies aim to find an empirical basis for the development of these design standards. Therefore, the hypotheses have been temporarily restated as follows:

7.1 Hypotheses and variables

1. A systematic approach leads to internally consistent formal curricula.
2. Internal consistency of the formal curriculum and programme effects are related positively.
3. A relational approach leads to external consistency.
4. External consistency and programme effects are related positively.
5. The relational approach compensates for weaknesses in the systematic approach.
6. The systematic approach does not compensate for weaknesses in the relational approach.
7. Though cost-benefit analyses are important for selecting efficient solutions to educational problems, they are not related to the programme's effectiveness.

Rival hypotheses:

8. The trainer plays a dominant role in the educational process. Thus, the driving force of the relational and systematic approach alone in curriculum design is itself insufficient to determine programme implementation and transfer conditions completely. As a consequence the relational and systematic approaches do not guarantee positive effects.

9. This limitation will be especially obvious when the developer and the trainer are not the same individual.

Variables:

From the conceptual framework and its constructs the following six variables have been derived:

Variable: **Systematic Approach:**

A systematic approach implies adequate application of design procedures including the following items:

= adequate assessment of training needs
= adequate description of goals
= adequate task analysis
= adequate instructional objectives
= adequate establishment of evaluation criteria
= adequate construction of evaluation instruments
= adequate design of learning situations
= adequate development of course materials

Variable: **Internal Consistency**

In an internally consistent formal curriculum, a logical relationship exists between assignment, objectives, evaluation criteria, evaluation instruments, instructional strategies and training materials. The formal curriculum comprises the following items:

= consistency between goals and needs assessment
= consistency between task analysis and preceding elements
= consistency between instructional objectives and preceding elements
= consistency between evaluation criteria and preceding elements
= consistency between evaluation instruments and preceding elements
= consistency between learning situations and preceding elements
= consistency between course materials and preceding elements

Variable: **Relational Approach**

A relational approach comprises activities that favour the involvement of managers and supervisors during design and implementation, the selection of trainers who have recent, practical experience in the subject matter field, and the creation of a learning situation that closely resembles the work environment. The relational approach comprises the following items:

= adequate assessment of training needs
= adequate task analysis
= creation of favourable conditions for implementation
= adequate selection of trainers and coaches
= adequate selection of trainees
= involvement of line managers
= design of learning situations that resemble the work environment
= selection of trainers that have experience with the work of trainees

Variable: **External Consistency**

External consistency refers to the homogeneity of ideas and perceptions among managers, supervisors, developers, trainers and trainees on the nature of the problem and its possible solution through an educational provision. External consistency comprises the consistency between views of:

= (top) manager and developer
= (top) manager and trainer
= (top) manager and supervisor
= (top) manager and employee (= trainee)
= developer and trainer
= developer and supervisor
= developer and trainee
= trainer and supervisor
= trainer and trainee
= supervisor and employee (= trainee)

Variable: **Cost-benefit Analysis**

The cost-benefit analysis variable comprises the following item:

= direct costs, salaries of trainees, overhead costs, lost opportunity costs, and estimation of benefits

Variable: **Effects**

Programme effects comprise the acquired skills, changes in performance and the impact on the organization as perceived by:

= (top) managers
= supervisors
= developers
= trainers
= trainees

7.2 Research Design

Study # 1 may be characterized as a multiple case study with multiple units of analysis, focusing on theoretical replication, described by Yin as a Type 4 study (Yin, 1989). The within-site and cross-site data analyses were carried out by means of display techniques as described by Miles and Huberman (1984).

As these case studies aim to detect factors in curriculum design that affect the quality of the outcomes, the research design comprises the

analysis of two sets of contrasting cases: successful and unsuccessful. Unlike Empirical Study #2 (where curricula have been designed deliberately as part of the research project), Study #1 concentrates on existing and implemented curricula. In that respect, the design may also be considered as a *post-facto* design (Sprinthall, Smutte & Sirois, 1991, p. 71). The cases have been selected by the local training managers on the basis of their subjective measure of the Effects variable (successful / unsuccessful). During the study a reliability test was run on the correct use of the labels 'successful' and 'unsuccessful'. The results of this test are reported in the Sections 8.4.1 and 8.4.2.

7.3 Selection of the Cases

Selection of the cases raised the following questions:

- What type of organizations should be addressed?
- Which kinds of programmes should be reviewed?
- Who determines whether programmes are successful or unsuccessful?

Theoretically there was no evidence to suggest the exclusion or inclusion of specific types of organizations, nor did the kind of programme matter. However, the programme had to have been developed at the request of the organization. Off-the-shelf courses and packages were to be excluded. The course design could have been carried out by either the in-house training staff or by an outside agency.

At the outset of the project, the definition of success or failure was left to the training manager. The researcher was mainly interested in the contrast between programmes that were considered to be successful or unsuccessful in the context of the organization itself.

Discussing the research project with training managers soon revealed that the main problem was to obtain access to cases, especially the unsuccessful ones. Managers are reluctant to offer failures for outside inspection. Furthermore, for this type of research the cooperation of developers and trainers was requested, as they would be interviewed and asked to provide the investigators with relevant curriculum materials. Publicly designating their programme as unsuccessful would make them reluctant to participate and inhibit a collaborative attitude. Therefore, this part of the study required studying the cases anonymously to obtain the trust of participating organizations. These considerations led to the following selection process:

- 50 training managers, with whom the researcher had previously established contact, were invited to offer two contrasting training programmes: one successful and one unsuccessful. To avoid insulting anyone the label 'less successful' was used.
- 14 training managers responded that they were willing to participate in the project (28 cases).
- When the time came to submit the cases for analysis, only 9 training managers succeeded in finding (top) managers, supervisors, developers, trainers and trainees - who had been involved in the programme - willing to participate in the data collection.
- 9 Successful and 9 unsuccessful cases were examined. Yet, during the data collection, one of the unsuccessful cases was withdrawn (Case 17), because top management objected to further analysis.

The remaining 17 cases were all tailor made or adapted to the organization's specific need. They included the following types of programmes:

Case:	
1, 2, 11, 12	technical skills
3, 4, 7, 8	interpersonal skills
5, 9, 10, 13, 14	computer skills
6, 15, 16	servicing skills
18	management skills

The participating organizations cover the field of banking, insurance, public service, industry, transportation and consulting.

7.4 Data Collection

Data collection was conducted by eight trained investigators, according to a data collection protocol. The protocol contained 28 pages of detailed guidelines for the investigator. The guidelines were derived from the variables and their constituting items. The protocol (see Appendix I) covered the following sections:

A. General information on the case:
- title of the programme
- name and phone number of the training manager
- subject matter of the programme
- schedule of the programme
- number of participants per group

B. Guidelines for the study of documents:
- documents on the assignment of the programme
- reports on needs and task analysis
- objectives
- evaluation criteria
- evaluation instruments
- instructional strategies
- training content
- training plans
- materials and artifacts such as exercises, case studies, role playing, simulations, assignments, software, tapes, slides, etc.
- descriptions of the equipment needed
- guidelines and manuals for trainers, coaches, supervisors, and others involved in the implementation of the programme
- a cost-benefit analysis

C. Guidelines for interviews with:
- (top) managers who commissioned the programme
- developer
- trainer(s)
- supervisors and local managers of the participants
- two or more trainees

(These informants involved in the development and implementation of the programme are referred to as 'the actors'.)

D. A framework for writing a case report
- Problem description
- Assignment
- Design and development of the programme
- Implementation
- Effects
- Comments of the investigator

7.5 Procedures for data collection, processing and analysis

This section provides an account of major activities concerning data collection, data reduction and data analysis. It includes two pilot studies, selection and instruction of data collectors (investigators), set up of case-study data bases, application of a coding scheme and selection and instruction of data analysts.

7.5.1 Pilot studies

The data collection protocol was applied to two pilot cases. The pilots served to test whether the guidelines offered sufficient help in structuring the document search and interviews and whether it was possible to maintain consistency for all cases. These pilots led to some minor revisions of the protocol, mainly deleting detailed and redundant questions on evaluation procedures that appeared to hamper the interview. The researcher investigated the pilot cases.

7.5.2 Selection and instruction of investigators

Eight investigators were invited from a group of training managers and consultants that had previously attended a two-year programme on training management conducted by the researcher. The investigators were instructed on the use of the data collection protocol. They learned the purpose of the research project as well as the implications of the research questions. The various sections of the protocol were discussed and demonstrated with the help of materials collected during the pilots. Each investigator studied a successful and an unsuccessful case from the same company. As the investigators were sometimes affiliated with companies that were competitors of the companies of the case studies, incompatibilities were scrutinized to eliminate potentially compromising combinations of investigators and cases.

During the instruction session, the actors' vulnerable position was discussed, in the unsuccessful cases in particular. The investigators were urged to maintain strict confidentiality and to assume a neutral attitude towards the cases, their actors and the information made available to them.

7.5.3 Case study data base

The investigators started by examining relevant documents on the assignment, design and development phases, training materials, evaluation instruments and records. They also inspected (physical) artifacts such as models, simulator equipment, demonstration materials, (video) films, slides, and the like. They interviewed (top) managers, supervisors, developers, trainers and trainees. In some cases, the programme's developer and trainer were the same individual. In some cases, super-

visors also acted as trainers. The interviews lasted between one and two hours. Arranging and scheduling the interviews was painstaking.

Interview reports were returned to the interviewees for correction and additional comments. Finally, investigators set up case study data bases containing:

- General information on the case (Section A)
- Results of a document search (Section B)
- Interview reports (Sections C1: manager; C2: developer; C3: trainer; C4: supervisor; C5: trainees)
- A case history (Section D).

The data base was submitted to the researcher on a floppy disk together with all available curriculum materials.

7.5.4 Selection and instruction of data analysts

Seven students of the schools of education at the Universities of Twente, Nijmegen and Groningen were invited to perform the data analysis. These analysts were informed of the purpose of the research project, the implications of the research questions and the case study method. They were instructed on the analysis of the case-study data bases, the use of the coding scheme, and the transfer of coded text fragments to the various displays.

7.5.5 Data analysis

Each case-study data base contained up to 40 pages of text. Data reduction was accomplished by applying coding and display techniques as described by Miles and Huberman (1984). The coding scheme was derived from the variables and their items. The codes were used to mark segments of sentences or paragraphs in the case-study data base. They are retrieval and organizing devices that allow the analyst to cluster all segments related to a particular variable or item. Appendix II contains the list of codes created for this study.

Each data base was coded separately by two data analysts. They compared their codings and made adjustments to obtain full agreement. Comparisons and discussions were particularly useful, as applying the correct code demanded considerable exercise and practice. The agreed

coded fragments were transferred to within-site displays. As the two data analysts handed in a single set of displays for each case, it was impossible to measure initial agreement between analysts. Ultimately, the displays were based on full agreement. The data analysis activities on all 17 cases took place simultaneously at one location in the presence of the researcher over five days. Emerging difficulties of interpretation and divergent opinions were submitted to the researcher and the clarifications communicated to the other analysts. This method enhanced consistency among analysts.

The qualitative analysis was completed by quantitative analysis. The researcher and analysts rated the items of the main variables on a 5-point scale, so that (Likert-)scales could be constructed for the variables Systematic Approach, Internal Consistency, Relational Approach, External Consistency, Cost-Benefit Analysis and Effect. Qualitative analyses were performed first. The design standards of Chapter 10 were based on these analyses. The quantitative analyses took place together with the analysis of the projects (in Chapters 12, 13 and 14) one year later. In the interest of clarity, however, the qualitative and quantitative results of the case studies are presented together.

For the quantitative analysis, data were rejected when jury $\alpha < .60$, scale $\alpha < .70$, and sub scale $\alpha < .60$.
The probability level $p < .10$ is justified by the small number of cases.

8 RESULTS STUDY #1

The results of the case studies are transformed through within-site displays (results of a single case, Section 8.1), to cross-site displays (see Section 8.2 and Appendix III for the summarized results of all cases) and cross-site macro displays (see Section 8.3 for these displays that contain only numerical values). Before drawing conclusions the initial labels 'successful' and 'unsuccessful' are reconsidered in Section 8.4. Finally, Likert scales for the main variables are constructed (see Section 8.5).

8.1 Within-Site Displays

For each case displays have been created for the following variables:

External Consistency:	Consistency between perceptions of the initial problem (Display I)
Relational Approach:	Actors' involvement (Display II)
Systematic Approach:	Programme development (Display III)
Internal Consistency:	Internal consistency of the programme (Display IV)
Cost-Benefit Analysis:	Cost-Benefit analysis (Display V)
Relational Approach:	Involvement of line managers (Display VI)
Relational Approach:	Similarity between learning situation and work environment (Display VI)
Relational Approach:	Practical experience of the trainer (Display VI)
Effects:	Actors' perceptions of effects (Display VII)

This volume does not include the original full-scale displays for each case. The bulk of data is still too vast to be presented[1]. Composing within-site displays accomplished considerable data reduction. Nevertheless, at least eight pages of displays remained for each case. The within-site displays of Case 2 are included in Appendix XIV and serve as an example.

[1] The full case study data bases may be inspected in the researcher's archives

8.2 Cross-Site Displays

Further data reduction was required for comparison among cases. This reduction was effected by creating cross-site displays, containing summaries and conclusions of the within-site displays. In Appendix III, two sets of cross-site displays are presented: the unsuccessful cases (odd numbers) and the successful cases (even numbers). The labels 'unsuccessful' and 'successful' remained, as they were attributed to the cases by the training managers. Later in this section, these labels are reconsidered.

8.3 Cross-Site Macro Displays

In the cells of the next two macro displays (Tables 8-I and 8-II) the symbols 0, +, ++, +++ and ++++ appear. They stem from the cross-site displays in Appendix III and were attributed by the researcher to indicate the presence of this unit of analysis (**0** indicates **absent**, and ++++ signifies **very strongly represented**). The symbols were placed in conjunction with the text, enabling outside observers to judge the consistency of the researcher's interpretations. The symbols of the preceding cross-site displays have been transferred to one single display per category of cases (Table 8-I: Cross-site macro display I: odd = unsuccessful; Table 8-II: Cross-site macro display II: even = successful). The patterns of the two sets reveal that Case 11 exhibits a deviant profile among the odd cases, as does Case 4 among the even cases. The background of this phenomenon is discussed in the sections that follow.

Table 8-I: Cross-site macro display I: Unsuccessful cases

Unsuccessful	Cross-Site Macro Analysis I.							
Unit of analysis	**Case 1**	**Case 3**	**Case 5**	**Case 7**	**Case 9**	**Case 11**	**Case 13**	**Case 15**
I: External Consistency: perceptions of the initial problem	0	+	++	0	++	+++	+++	+++
II: Actors' Involvement	0	+	+	+	+++	++++	0	++
III: Programme Development	++	0	0	0	0	++++	0	0
IV: Internal Consistency	+	0	0	0	++	++++	0	+
V: Cost-Benefit Analysis	++	0	0	0	0	0	+	0
VI/1: Involvement of Line Manager	0	+	+	+	+	++++	0	+
VI/2: Similarity Learning Situation/ Work Situation	++	0	0	+	0	++++	0	0
VI/3: Practical Experience of the Trainer	0	0	0	+	0	++++	0	0

Table 8-II: Cross-site macro display II: Successful cases

Successful	Cross-Site Macro Analysis II.								
Unit of analysis	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
I: External Consistency: perceptions of the initial problem	+++	0	++++	+++	++++	++++	+++	++++	++++
II: Actors' Involvement	+++	+	+	+	+++	++++	+++	++++	+++
III: Programme Development	+++	0	+	+	+	++++	+++	++++	++++
IV: Internal Consistency	+++	0	+++	+	+++	++++	+++	++++	+++
V: Cost-Benefit Analysis	++	0	0	0	0	++	+	++++	+++
VI/1: Involvement of Line Manager	++++	+	+	+	++++	++++	++++	++++	++++
VI/2: Similarity Learning Situation/ Work Situation	++++	0	++++	++++	++++	++++	++++	++++	+++
VI/3: Practical Experience of the Trainer	++++	0	++++	++++	++++	++++	+++	++++	++

8.4 Effects

Before drawing conclusions, it was imperative to reconsider the initial labels 'successful' and 'unsuccessful'. For that reason, additional analysis was performed. As the cases generated virtually no data on programme evaluations, a *post-hoc* test on effects was run. The procedure is described below.

8.4.1 *Post-hoc* test on effects

From the original displays containing the perceived effects of the programme the case numbers have been removed and replaced by random letters A to Q. Thus, cases could not be recognized as unsuccessful or successful by its odd or even case number. The key-code 1-18 = A-Q was known only by the researcher. Two judges (expert training consultants) each assessed the actors' statements on the perceived effects by rating the statements on a five-point scale (1 = no effect; 5 = highly effective). The rating took place according to prescribed instructions from the researcher (see Appendix XII: Instructions for assessing effects). Once all cases had been rated, the two judges compared their ratings and discussed differences. This discussion was considered necessary because the quality of the statements in the displays varied considerably. Statements referred to reactions of trainees, test results, changes in performance and effects on the department or organization. The judges had been invited to interpret the statements and describe their reasoning explicitly to one another. This articulation of their assessment improved their mutual understanding of each statement and led to a single agreed value for that statement. They submitted a single set of ratings of each case. Table 8-III presents the results of these ratings of the cases' effects.

Thus, choosing for this rating method generated only one set of values for further analysis. A check on inter-rater agreement between the two judges could not be run. To compensate, the rating process was repeated in a different setting. During a workshop on training design for 45 members of the Nederlandse Vereniging van Opleidingsfunctionarissen - NVvO [Dutch Training and Development Association] the Effects-displays of the 17 cases were assigned to eight groups of five to six participants. Each group received two to three cases and was asked to assess the statements according to the prescribed instructions. First, individual group members rated the statements. Then, they discussed their ratings.

Table 8-III: Effects of cases

Case	Experts	NVvO	$\overline{X}$**
1	9.00	9.00	9.00
2	21.00	20.00	20.50
3	14.00	8.00	11.00
4	13.00	11.00	12.00
5	7.00	8.00	7.50
6	18.00	15.00	16.50
7	12.00	14.00	13.00
8	24.00	15.00	19.50
9	10.00	11.00	10.50
10	19.00	19.00	19.00
11	22.00	22.00	22.00
12	22.00	23.00	22.50
13	12.00	12.00	12.00
14	17.00	16.00	16.50
15	14.00	12.00	13.00
16	18.00	15.00	16.50
18	21.00	21.00	21.00
	α = .92*	α = .89*	r = .85***
α = .94*	$\overline{X}$ = 15.41**	s = 4.78	see App.IV

* consistency between the scores of the written statements reflecting the actors' perceptions of effects
** $\overline{X}$ of total scores of 5 actors
*** correlation between the ratings by Experts and NVvO participants

As a result of the group discussion, each group submitted a single set of ratings for each statement about each case. Table 8-III shows the results of these ratings of the cases' effects. Comparison of the two ratings showed a correlation of r = .85. The large differences in ratings between

Case 3 and Case 8 could not be explained. Although these differences were considerable, they did not affect the ranking of these two cases among the successful (#8) and unsuccessful (#3). The results of these ratings and the statistical checks allow relabelling of the cases: unsuccessful is an Effect score < 15.00, successful is an Effect score > 15.00.

On the basis of the two ratings a Likert scale was constructed (see Appendix IV). This scale was used to calculate the correlations of the variables Systematic Approach, Internal Consistency, Relational Approach, External Consistency, Cost-Benefit Analysis and Effect.

The ratings of the perceived effects of the 17 cases (Table 8-III) made it possible to rank the cases according to their new total scores ($\overline{X}$ of Experts and NVvO). When cases' scores were tied, ties were broken by using the combined ratings of managers and supervisors as a second ranking key. Table 8-IV shows the ranked cases.

Table 8-IV:
Cases ranked on effects

Case	Total	$\overline{X}$*
12	22.50	4.50
11	22.00	4.40
18	21.00	4.20
2	20.50	4.10
8	19.50	3.90
10	19.00	3.80
16	16.50	3.30
14	16.50	3.30
6	16.50	3.30
15	13.00	2.60
7	13.00	2.60
13	12.00	2.40
4	12.00	2.40
3	11.00	2.20
9	10.50	2.10
1	9.00	1.80
5	7.50	1.50
Scale α = .94	$\overline{X}$ = 15.41 s = 4.78	$\overline{X}$ = 3.08 s = .96

* $\overline{X}$ per actor

8.4.2 Unsuccessful and successful cases reconsidered

As the 17 cases included 9 successful and 8 unsuccessful cases, the *post-hoc* tests ranked the most effective programmes above the least effective programmes. Even-numbered cases are clearly ranked above the odd-numbered cases, except for Case 11, which is ranked among the highest effective and Case 4, which is ranked among the least effective. The aforementioned deviant patterns of

these cases in the Cross-Site Macro Displays 8-I and 8-II carry over into the case-effect ranking scale. The researcher contacted the two training managers who submitted Cases 4 and 11 and informed them of the discrepancies. A summary of their responses follows.

Case 4
Upon hearing the findings of Case 4, the training manager acknowledged that the case was not a very successful one. His problem was that, although he was willing to participate in the research project, he had no truly successful programme to offer. The trainees of Case 4 appreciated the trainer slightly more than those of the other programmes available. He admitted that, in the company's view, there was little contrast between Case 4 and the other case submitted.

Case 11
The developer in this case held very high aspirations of designing a competency-based programme. He focused very much on skill acquisition, frequent individual practical training, and on a minimum of theoretical classroom lecturing. Thus, he achieved a highly efficient programme design that kept the number of training days to a minimum. However, the client did not approve of this approach. The client felt the programme failed to provide a general theoretical background on the subject matter. The developer argued that the necessary knowledge of concepts and principles was discussed in the programme when preparing and debriefing the practical sessions. Nevertheless, the client insisted on more classroom training. Hence, the developer, very much against the grain of his training concept, added several days of classroom lectures as the client wished. Both developer and training manager felt they had failed and subsequently labelled their programme as unsuccessful.

From these observations the researcher concluded that Case 4 should be relabelled 'unsuccessful' and Case 11 'successful'.

8.5 Values of the main variables in the cases

In addition to the quantitative transformation of the Effect variable, similar analyses were carried out for the other variables. The data for the Systematic Approach, Internal Consistency, Relational Approach, and Cost-Benefit Analysis were obtained as follows:

a. The researcher transformed the display qualifications 0, +, ++, +++ and ++++ of the items belonging to the above men-

tioned variables into 1, 2, 3, 4, 5, ranging from 1 = highly inadequate / inconsistent to 5 = highly adequate / consistent.

b. The data analysts rated items from the original data collection protocol on a 5-point scale (1 = highly inadequate / inconsistent to 5 = highly adequate / consistent).

As the data from the displays (rated by the researcher) are reduced from several items of the data collection protocol, the analysts originally rated many more items. For these items additional sub-scales were constructed. (Sub-scales were rejected when the scale $\alpha < .60$). Ratings for 14 out of the 24 items (constituting the variables Systematic Approach, Internal Consistency, Relational Approach and Cost-Benefit Analysis) to be included in the Likert scales were available from both the researcher and the analyst. Only four of these had to be rejected because of a low jury α ($< .60$). This high degree of agreement between researcher and analysts justified the inclusion of items for which only the researcher's ratings were available. Table 8-V shows an analysis of the scales for the six main variables in this study. Appendix IV contains the full scales.

Table 8-V: Case study scale analysis

Scale:	k	$\overline{X}$	s	scale α
Systematic Approach	5	2.72	.96	.76
Internal Consistency	5	2.63	1.20	.77
Relational Approach	5	2.89	1.31	.86
External Consistency	5	3.21	.98	.91
Cost-Benefit Analysis	5	1.88	1.29	.96
Effects	5	3.08	.96	.94

Scale points denoting: 1: highly inadequate/inconsistent/ineffective, to 5: higly adequate/consistent/effective

The data on the external consistency were quantified as follows:

a. For each (blind) case, three judges assessed the consistency of the perceptions of managers, developers, trainers, supervisors and

trainees. Besides the specific assessment of the consistency between pairs of actors, a score was assigned for overall consistency. Appendix VI lists the instructions to the judges.

b. Sub-scales were constructed for the scores on the pairs of actors and the overall consistency for each judge.

c. Correlations between specific scores and overall scores were computed for each judge.

Table 8-VI: Values of the main variables in Cases

Case	Systematic Approach	Internal Consist.	Relational Approach	External Consist.	Cost-Benefit	Effects
1	2.98	2.25	1.83	1.30	3.00	1.80
2	4.19	3.63	4.11	3.17	3.50	4.10
3	1.50	1.00	1.25	2.70	1.00	2.20
4	2.50	1.56	1.42	1.68	1.00	2.40
5	2.31	2.25	1.69	2.69	1.00	1.50
6	2.00	1.69	3.06	5.00	1.00	3.30
7	1.63	1.31	1.86	2.07	1.00	2.60
8	2.00	1.88	3.50	2.95	1.00	3.90
9	2.13	2.19	1.44	3.15	1.00	2.10
10	2.65	2.56	4.42	4.30	1.00	3.80
11	3.48	4.94	4.25	4.26	1.00	4.40
12	3.90	4.75	4.83	3.43	3.00	4.50
13	1.77	1.50	1.39	3.76	1.50	2.40
14	2.63	3.06	4.33	3.19	2.00	3.30
15	2.08	2.38	2.33	2.87	1.00	2.60
16	4.28	3.94	4.36	3.76	4.50	3.30
18	4.31	3.88	3.11	4.24	4.50	4.20

d. The sub-scale α's and correlations were high. This justified the construction of a scale for External Consistency on the basis of the three sub-scales and overall scores of the three judges. The full scale for External Consistency is included in Appendix IV. A summary is included in Table 8-V.

Finally we present the cases and their values for the six main variables in Table 8-VI.

The aim of the multiple case study was to detect factors in curriculum design that affect the quality of corporate education. The first of the two empirical studies is based on two sets of contrasting cases: one successful and the other unsuccessful. To assess whether or not the two groups differ on the main variables, t tests were run on these variables. Appendix V shows the results. The variable Cost-Benefit differs significantly between the two groups of cases at $p < .10$, while the variables Systematic Approach, Internal Consistency and External Consistency differ significantly at $p < .01$, and the variables Relational Approach and Effect differ at $p < .001$.

9 CONCLUSIONS AND DISCUSSION STUDY #1

The major research questions addressed in the first study are:

1. What factors in curriculum design affect the quality of corporate education?
2. How do these factors operate?

This section formulates answers to these questions to the extent that it is possible to generalize on the basis of the theory developed in the conceptual framework. To that end, the main variables and their constituting elements will be discussed and the hypotheses confronted with the findings. In addition, some statements will be made on the research design and its limitations. Brief observations are made on the construct validity, internal validity, external validity and reliability of the case study.

9.1 Conclusions

The main variables to be examined were: Systematic Approach, Internal Consistency, Relational Approach, External Consistency, Cost-Benefit Analysis and Effects. The data were collected from two sets of contrasting cases. To visualise the differences between the two, data from Table 8-VI in the preceding section are depicted in graphic form. The cases are ranked according to their Effect value. The numeric values are represented by the graphic sign (#). Thus, Table 9-I shows a graphic pattern for the variables.

The observations that follow are made on the basis of the values of the main variables (Table 8-VI and Table 9-I in this section) and the comparison of successful and unsuccessful cases (t values in Appendix V), combined with additional qualitative information from the cross-site displays (in Appendix III).

Systematic Approach

In successful cases a significantly better systematic approach is applied than in the unsuccessful cases, t (12.14) = -3.18, p = .008. However, in most cases, whether successful or unsuccessful, documentation on the design and development process is poor (Appendix III: Display III).

Table: 9-I: Graphic pattern of variables

Case	Systematic Approach	Internal Consist.	Relational Approach	External Consist.	Cost-Benefit Analysis	Effect
12	###	####	####	###	###	####
11	###	####	####	####	#	####
18*	####	###	###	####	###	####
2	####	###	####	###	###	####
8*	##	#	###	##	#	###
10*	##	##	####	####	#	###
16	####	###	####	###	####	###
14*	##	###	####	###	##	###
6*	##	#	###	####	#	###
15	##	##	##	##	##	##
7*	#	#	#	##	#	##
13*	#	#	#	###	#	##
4*	##	#	#	#	#	##
3*	#	#	#	##	#	##
9*	##	##	#	###	#	##
1*	##	##	#	#	###	#
5	##	##	#	##	#	#

(*) denotes that developer and trainer are one and the same person.

(#) denotes value $1 \leq \# < 2$

(##) denotes value $2 \leq \#\# < 3$

(###) denotes value $3 \leq \#\#\# < 4$

(####) denotes value $4 \leq \#\#\#\# \leq 5$

Some conclusions from the data are:

- Reports on training needs assessment and task analysis are mostly absent.
- Instructional objectives of unsuccessful programmes tend to be stated in terms of reproductive knowledge aspects.
- Instructional objectives of successful programmes tend to be stated in terms of reproductive and productive skills.
- In both types of cases, evaluation criteria are neither stated nor documented.
- In both types of cases, evaluation instruments are restricted to the lowest levels of evaluation: reaction to learning processes and tests of training results. Virtually none of the cases used instruments to assess performance or organizational impact.
- In the successful cases, the designed learning situations show a greater variety of activities than in those that are unsuccessful.
- Almost all cases used elaborate training materials. Successful cases devoted more attention to guidelines for trainers.

Internal Consistency

Successful cases had significantly greater internal consistency between the assignment, objectives, evaluation, learning situations and training materials than the unsuccessful cases, t (11.39) = -3.64, p = .004, (Appendix III, Display IV).

Relational Approach

Successful cases applied a significantly better relational approach than the unsuccessful cases, t (15) = -9.38, p = .000.

From the qualitative data the following conclusions can be drawn:

- Actors' involvement during development and implementation is strong in successful programmes (Appendix III, Display II).
  The successful cases show strong involvement by line managers in particular. The unsuccessful cases do not (Appendix III, Display VI-1).
- The similarity between learning situations and work environment is extremely strong for the successful cases and is correspondingly weak for the unsuccessful cases (Appendix III, Display VI-2).
- Practical experience in the subject matter field of the trainer is extensive in the successful cases and limited in the unsuccessful cases (Appendix III, Display VI-3).
- Six of the successful cases emphasized creating favourable cir-

cumstances for implementation. None of the unsuccessful cases emphasized this aspect (Appendix III, Display III-6).

External Consistency

In the successful cases, consistency between actors' perceptions of the initial problem at hand is significantly stronger than in the unsuccessful cases, t (15) = -3.56, p = .003.

Cost-Benefit Analysis

In general cost-benefit analysis is given little attention. Successful and unsuccessful cases still differ significantly, t (11.57) = -1.91, p = .081. Some of the successful cases included records of the salary costs of developers and trainers. Records of salary costs of trainees were available in four cases. One case mentioned overhead costs of training staff. One case provided an estimation of lost opportunity costs. Only one case contained an estimation of benefits.

9.2 Findings related to the hypotheses

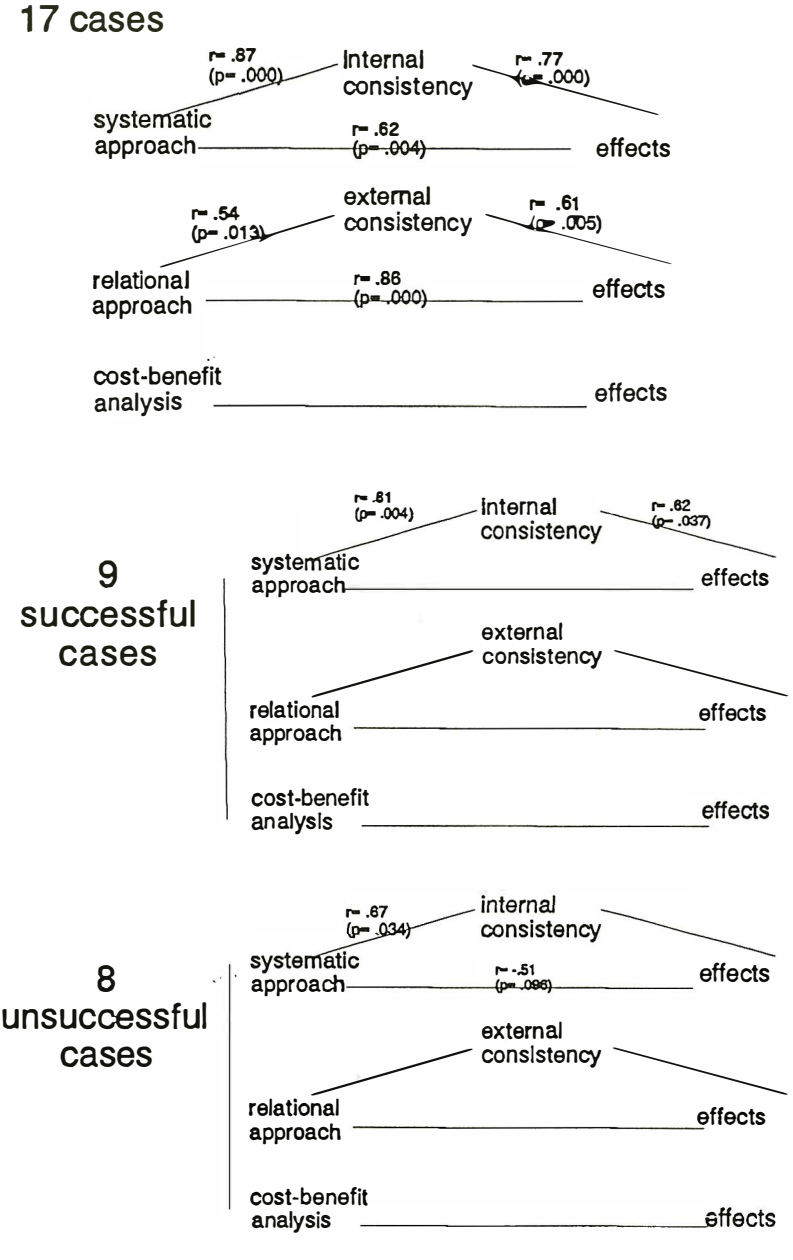
To relate the findings to the hypotheses, relevant correlations between variables have been computed. The significant correlations ($r \geq .40$, $p < .10$) are displayed in Table 9-II. On the basis of these findings, the hypotheses are examined and discussed in relation to the conceptual framework. The probability level $p < .10$ is justified by the small number of cases.

Hypothesis 1:
A Systematic Approach leads to Internally Consistent curricula.

Significant correlations were found for all cases, r = .87, p = .000, and in successful, r = .81, p = .004, as well as in unsuccessful cases, r = .67, p = .034. None of the cases reveal a high value for systematic approach together with low internal consistency (see Table 9-I). This hypothesis should not be rejected.

Hypothesis 2:
The Internal Consistency of the formal curriculum and programme Effects are related positively.

Table 9-II: Correlations between main variables in cases



Significant correlations were found for all cases, $r = .77$, $p = .000$, as well as for successful cases, $r = .62$, $p = .037$. This hypothesis should not be rejected.
Deviations appear in Cases 8, 10 and 6 (see Table 9-I). They reflect low values for Internal Consistency, < 3.00, but are nevertheless ranked among the successful cases. Apparently, low Internal Consistency does not affect Effect in these cases.

Hypothesis 3:
A Relational Approach leads to External Consistency.

Significant correlation was found for all cases, $r = .54$, $p = .013$. This hypothesis should not be rejected.
Only Case 8 shows a high value for Relational Approach (3.50) in conjunction with low External Consistency (2.95), although this value is close to 3.00 (See Table 8-VI). Cases 13 and 9 (Table 9-I) reveal that the Relational Approach is not conditional for External Consistency.

Hypothesis 4:
External Consistency and programme Effects are related positively.

Significant correlation was found for all cases, $r = .61$, $p = .005$. This hypothesis should not be rejected.
Of all successful cases, only Case 8 has a value for External Consistency <3.00 (2.95). Cases 13 and 9 contradict the hypothesis. They have high values for External Consistency but are ranked among the unsuccessful cases (Table 9-I).

> Further examination of the qualitative data on these cases (in the displays of Appendix III) reveals the following:
> Both cases concern computer training.
> In Case 9 the developer/trainer was a management trainee, who was inexperienced in both the subject matter field and in the training profession.
> In Case 13 the external developer/trainer was unfamiliar with the organization, the equipment and the computer application to be instructed (Appendix III, Cross-Site Display III, Item 10; Cross-Site Display VI, Item 3).

These observations stress the importance of hiring a trainer who is both a training professional and a subject matter expert. Apparently, External Consistency can not compensate for poor qualifications in trainer performance nor in subject matter expertise. Selection of the trainers and their practical experience in the subject matter fields are critical elements

in the relational approach. This conclusion implies that training of trainers should emphasise subject matter expertise as well as intensive coaching and mentoring of novices.

Hypothesis 5:
The Relational Approach compensates for weaknesses in the Systematic Approach.

Successful cases with a weak Systematic Approach, defined as <3.00, (Cases 8, 10, 14 and 6; see Table 9-I) all exhibited a Relational Approach ≥ 3.00. The high value for the Relational Approach seems to compensate for the low value of the Systematic Approach, as these cases are considered successful. On the basis of this reasoning, this hypothesis should not be rejected.
As the Relational Approach and External Consistency are closely related, as are the Systematic Approach and Internal Consistency, a similar method of reasoning applies to the compensating quality of External Consistency in case of weak Internal Consistency. Cases 8, 10 and 6 show low Internal Consistency. Their External Consistency, which is $\geq$ 3.00 (#8: 2.95), might compensate for that weakness.

Hypothesis 6:
The Systematic Approach does not compensate for weaknesses in the Relational Approach.

In the group of successful cases, none shows a Relational Approach $\leq$ 3.00. In other words, there are no low values to be compensated. In the unsuccessful group, Cases 4, 9, 1, and 5 show stronger Systematic than Relational Approach, although < 3.00. As these cases are ranked lowest, a presumed compensating quality is not effective. Furthermore, the unsuccessful cases show a negative correlation between Systematic Approach and Effects, $r = -.51$, $p = .096$. This figure indicates that investments in systematic design of the formal curriculum may become counterproductive when the development process does not satisfy the relational approach. The research design does not permit conclusions whether the relational approach is satisfactory alone for programme effectiveness.
On the basis of this reasoning this hypothesis should not be rejected.

The combination of Hypotheses 5 and 6 might indicate that, although the

systematic approach is indispensable for internally consistent curricula, it can be effective only when combined with a relational approach and external consistency. This assumption would explain why successful programmes have benefitted from the systematic approach (Internal - Effect: $r = .62$, $p = .037$), whereas unsuccessful programmes have not (Systematic - Effect: $r = -.51$, $p = .096$).

Hypothesis 7:
Although cost-benefit analyses are important for selecting efficient solutions to educational problems, they are not related to effectiveness.

No significant direct or reverse correlation was found concerning a relationship between Cost-Benefit Analysis and Effect. This hypothesis should not be rejected.

One might argue that performing a cost-benefit analysis for an educational programme is part of a systematic approach. Analysis of numbers of participants, of trainee salary costs and their (lost) opportunity costs direct decisions on instructional strategies, course length, selection of media, group size and number of trainers, in view of the expected benefits. Here, cost-benefit analysis is treated as an independent variable, separate from the systematic approach. It contributes to the efficiency, rather than to the internal consistency of the programme.

Rival hypotheses:

Hypothesis 8:
The trainer plays a dominant role in the educational process. Thus, the driving force of the relational and systematic approach alone in curriculum design is itself too weak to determine programme implementation and transfer conditions completely. As a consequence, the relational and systematic approaches do not guarantee positive effects.

On the basis of the positive correlations between Effect and Relational Approach, $r = .86$, $p = .000$, and Effect and Systematic Approach $r = .62$, $p = .004$, this rival hypothesis should be rejected.
However, in view of the previous discussion of the unsuccessful Cases 9 and 13 the trainer's important role is emphasised. Selecting trainers with practical experience in the subject matter field and coaching their educational skills seem to be critical to the relational approach.

Hypothesis 9:
This limitation (of the relational and systematic approach) will become especially obvious when the developer and the trainer are not the same individual.

Rejection of Hypothesis 8 makes this hypothesis irrelevant. However, we compared the values of the main variables of the group of cases where one individual is both trainer and developer (Cases 1, 3, 4, 6, 7, 8, 9, 10, 13, 14, 18) with the other group (Cases 2, 5, 11, 12, 15, 16), where the roles of developer and trainer are served by two (or more) staff members. Statistical comparison was established by performing *t* tests. Table 9-III shows the *t* values for the main variables.

Table 9-III: Trainer-developer: *t* values

Variable:	*Trainer = Developer* $n=11$ $\bar{X}$	s	*Trainer ≠ Developer* $n=6$ $\bar{X}$	s	*t*	*df*	*p*
Systematic Approach	2.37	.79	3.37	.96	-2.32	15	.035
Internal Consistency	2.08	.84	3.65	1.14	-3.25	15	.005
Relational Approach	2.51	1.21	3.60	1.27	-1.74	15	.103
External Consistency	3.12	1.15	3.36	.58	-.48	15	.641
Effect	2.91	.82	3.40	1.18	-1.01	15	.328

The two groups do not significantly differ on the variable Effect, t (15) = -1.01, p = .328. This too, indicates that it is unlikely that a curriculum will be effective only when the trainer is also the developer. This finding supports the rejection of rival hypotheses 8 and 9. The two groups neither differ significantly on the variable Relational Approach, t (15) = -1.74, p = .103, nor on External Consistency, t (15) = -.48, p = .641.

However, splitting the tasks of trainer and developer appears to affect the Systematic Approach, t (15) = -2.32, p = .035, and Internal Consistency, t (15) = -3.25, p = .005. The mean values of these variables are significantly higher when the trainer and the developer are not one and the same person. It is plausible that, when an organization specifically employs the function of instructional developer, the quality of the formal curriculum is likely to be high (internal consistency) because the design procedures (systematic approach) have been applied more skilfully. When the trainer designs the programme, it is likely that more attention is devoted to the operational curriculum than to the formal. Moreover, these comments on skilful design should not be confounded with the design quality related to the programme's effectiveness.

This section relates the findings of the case studies to the hypotheses of the research project. The findings support the concepts of the theory on curriculum consistency, which evolved from the conceptual framework. The next step entails developing design standards based on this theory. The relational and systematic approaches play a dominant role in these standards and will be integrated in the suggested procedures. Qualitative data from the case studies will enhance their practical usefulness. The development of these standards is described in Chapter 10. Part III of this study contains the revised version of the standards.

Curriculum design is a profession in itself. Therefore, design standards require skilful application to become effective. So, the developers that participated in the second empirical study took a course on curriculum design while working on their projects. Chapter 11 provides the outline of this programme.

The curriculum projects in the second empirical study evaluate the design standards. They also replicate the 17 case studies discussed so far. Equivalent hypotheses will be tested. Sections 12 to 14 report on findings in these projects. The second empirical study concludes by comparing cases and projects. The results of the emerging discussions may lead to modification of the theoretical framework as well as the design standards.

This section concludes with some observations on the reliability and validity of the first study.

9.3 Reliability

Reliability of the findings may be claimed since the following techniques have been used:

- Coding the data bases was done by two analysts who discussed divergencies and aimed at a consensus.
- Rating the statements on programme effects used 'blind' cases to reduce bias by expectancy.
- Rating the statements on programme effects took place twice: once by two judges and once by five judges. On both occasions divergencies were discussed and consensus was achieved. The correlation between the ratings of the two groups of judges was $r = .85$.
- Three judges independently rated the actors' perceptions in the External Consistency variable ($\alpha = .91$).
- Data were rejected at jury $\alpha < .60$, scale $\alpha < .70$, sub-scale $\alpha < .60$.
- Correlations were considered to be significant when $r \geq .40$ at $p < .10$.

To ensure the possibility of repeating the operations of this study (such as the data collection and analysis procedures), the following precautions were taken:

- The operations were described in detail;
- All investigators used the exact same data collection protocol;
- Investigators received training in protocol use;
- A data base was developed for each case study, to enable other researchers to review the evidence directly and without being limited to this written report;
- Analysts scrutinized the data bases according to the coding scheme they had been trained to use.

9.4 Construct validity

In this study, the 'existence' of the theoretical constructs of *internal and external curriculum consistency* and their attributes is hypothesised and inferred from observations of reality. Construct validity was secured by applying techniques for case study research as suggested by Yin (1989):

- The use of multiple sources of evidence: six categories of informants, document study, interviews and study of artifacts. (This tactic is also referred to as triangulation: a qualitative cross-

validation. It assesses the sufficiency of the data according to the convergence of multiple data sources or multiple data collection procedures [Wiersma, 1991, p. 233]).

- Key informants reviewed the interview minutes and made revisions and additions.

The data on programme effects are derived from statements on *perceived* effects. Although the reliability of the inter subjective ratings of these statements has been cautiously verified and tested, these ratings remain opinions on effects. No data were available for operational indicators such as records of test results, quality of services, implemented systems, changes in sales, rejection rates, turnover, grievances, waste, production costs, client satisfaction, or accidents. Moreover, if such data could have been included in the study, they would have raised many more methodological problems. For 17 cases, it would have been unfeasible to establish unambiguous and objective links between the skills acquired in a specific training programme and their impacted organizational changes.

However, some of the precautions taken to secure reliability (discussed in Section 9.3) might conflict with construct validity. The following dilemma arose: the main variables consisted of items and sub-scales that were carefully selected and justified by theoretical underpinnings. Seven out of 24 items had to be rejected due to low α values. The problem of deleting items from a scale - originally imposed for reliability - raises the question as to whether the scale still assesses accurately the construct to be measured or violates content validity. To resolve this problem, the researcher applied the following strategy. Throughout the quantitative analysis, reliability criteria should be strictly enforced (jury $\alpha \geq .60$, scale $\alpha \geq .70$, sub-scale $\alpha \geq .60$, and $r \geq .40$ at $p < .10$). The values of variables from which items were deleted (Systematic Approach, Relational Approach, and Internal Consistency) have been compared with those based on the qualitative analysis in an earlier stage of the study and refer to the complete items. To that end, Table 9-I, containing the graphic representation of the values, was compared with Cross-Site Macro Display XII (see Appendix III). Of 51 relevant values for Systematic Approach, Internal Consistency and Relational Approach, 9 deviated. Thus, it was possible to establish a concurrent validity between the qualitative and quantatitive analysis of $r = .71$ for the Systematic Approach, $r = .76$ for Internal Consistency, and $r = .94$ for the Relational Approach. The results of this additional analysis justify the conclusion that deleting items, due to low α values did not affect construct validity.

9.5 Internal validity

As the case study method aims at theoretical replication, explanations rely heavily on the theoretical assumptions from the theoretical framework. The framework that forms the basis of this study provides two principal analytical strategies:

a. systematic approach → internal consistency → effects
b. relational approach → external consistency → effects

By means of pattern-building procedures and statistical analysis, evidence was inferred for the two analytical strategies. Specifically, the patterns of the two contrasting sets of cases attributed to the criterion variable Effect (successful - unsuccessful) provided the logical basis for such inferences. For the contrasting sets of cases, significant correlations could be obtained to support the qualitative patterns.

However, this multiple case study provides information on a limited number of influencing factors: those that have been dealt with in the conceptual framework. Specific characteristics of trainees, factual events in the learning situation, trainer performance, training content, type of organization, training history and training policy of the organization were not taken into account. The *post-facto* research strategy eliminated the possibility of relying on observations as a major source for data collection.

The rival hypotheses concerning the predominant role of the trainer projected a plausible 'third variable' (Cook & Campbell, 1979), for which the explanations could be ruled out.

9.6 External validity

Case study research does not primarily aim to generalize to a larger universe. The cases may not be regarded as elements of a random sample of a population. However, two kinds of replication logic were used in this study:

- literal replication was applied within each of the two sets of contrasting cases
- theoretical replication was applied across the two sets.

The hypotheses explicitly described the framework for these replications

at the outset of the investigations. This prerequisite, advocated by Yin (1989) and Miles & Huberman (1984), was adopted without reservations.

The generalizing effect of the case studies largely depends on the causal conclusions that can be inferred. This type of conclusion is permitted only on the basis of a theory with more general applications than the description of a single case. It is primarily this causal interpretation that has a more extensive bearing (Stokking, 1984). The kind of theory implied has been elaborated in the conceptual framework, and the causal interpretation has been explained in Section 9.2. Furthermore, the large number of cases that have been investigated allows wider generalization in spite of their being limited to case study research. The findings specifically apply to the design of tailor-made and customized programmes and to a broad variety of subject matter fields.

10 DEVELOPMENT OF DESIGN STANDARDS

The aim of this study is to develop a coherent set of design standards that may be validated by empirical research. These standards should contribute to the overall goal of corporate education, which involves:

- influencing the necessary skills of employees,
- contributing to achievement of goal oriented changes in performance and work environment,
- intending a desired impact on the organization,
- applying planned learning activities and the related learning processes.

10.1 Conditions

The theoretical underpinnings have been explored in the context of the conceptual framework and tested in the case study research. The components are now available. They need to be presented in a practical format so that they may be applied by developers. The need for practical application of the components also indicates some important conditions for setting up design standards.

a. The theoretical foundations have to be translated into practical instructions without impeding the underlying paradigms.

b. The procedures must be suitable for developers in search of an efficient tool for educational problem-solving in the specific context of their organization.

c. Though developing educational programmes must be regarded as a professional occupation that requires dedicated training, design standards should also serve as job aids for less experienced developers.

10.2 Foundations

At the outset of this study, a theory of curriculum consistency was developed. The main paradigms of this theory are:

a. The *attained* curriculum should be consistent with the *ideal* curriculum (Section 2.2.1).

b. In striving for this consistency, the intermediate curricula (intended, formal, perceived and operational) should be consistent with each other. This aspect is called *external consistency* and refers to the homogeneous notions of the parties involved, of the nature of the problem and possible solutions (Section 2.2.4).

c. In striving for external consistency, the developer should adopt a *relational approach.* The relational approach refers to the developer's activities in the domain of interpersonal dynamics of decision-making on educational planning. It aims at gaining commitment, involvement and support for implementation (Chapter 5).

d. The programme design that results in the formal curriculum, should be consistent in itself. This *internal consistency* reflects logical contingencies among purpose, objectives, strategies and evaluation (Section 2.2.5).

e In striving for internal consistency, the developer should adopt a *systematic approach*, which involves rational data collection, analysis, application of instructional theory and learning theory, and composing a structured plan for learning situations (Chapter 4).

f. In the multiple case study, empirical evidence has been inferred as to the relationships between these concepts and their constituent elements (Chapter 9). Besides the evidence of the consistency theory, it was concluded that external consistency was a prerequisite for an internally consistent formal curriculum to be effective.

g. The generic model for educational problem-solving (Plomp, 1982) provides a framework for design standards that encompass both a relational and a systematic approach (Section 3.2).

Design standards will be developed on the basis of these conditions and foundations.

10.3 A blueprint for design standards

Generic Model	Design Steps	Project Management
Preliminary Inquiry	1. Training Needs Assessment	Appoint a project manager Designate a top manager in the role of principal State the assignment Plan the project (including activities, capacity, schedule, and budget) Recruit project team Discuss operating procedure Assess the training need
	2. Goals	Determine the major goals of the curriculum
Design	3. Task Analysis	Execution of task analyses Instructional objectives Evaluation criteria Evaluation instruments Design learning situations - educational format - instructional strategies
	4. Instructional Objectives	
	5. Evaluation Criteria	
	6. Evaluation Instruments	
	7. Design Learning Situations	
Construction	8. Select and Instruct Trainers	Choose the project team members, such as trainers, coaches, and mentors Compile the course material Plan the execution Instruct trainers and other members of the project team Select trainees
	9. Develop Training Materials	
	10. Favourable Conditions for Implementation	
	11. Select Trainees	
Test & Revision	12. Conduct Training Programme	Run a pilot programme Evaluate the learning process Evaluate the learning results Adjust the learning situations
	13. Evaluate Process & Results	
Implementation	14. Evaluate Performance and Impact	Deliver the programme Evaluate changes in the work environment Assess the impact on the original problem Adjust the design Take procedural measures Conclude the project

Figure 10-1: A blueprint for design standards

In principle, it is irrelevant whatever practical form design standards take and in what model they are cast. It is even argued that developers should be encouraged to adapt and customise their own ISD-model, as this is the only one that they will put into action (Section 3.1). However, developers can increase the effectiveness of their designs and the efficiency of the development process by operating within the framework of the generic problem-solving model and by applying the elements of the relational and systematic approaches. These elements are derived from Section 4.1 (assessing the systematic approach) and Section 5.4 (assessing the relational approach). In the blueprint for the design standards, these elements are compiled and presented in the matrix of Figure 10-1.

On the basis of this blueprint, two planning models have been designed.
Model 1: Project management for curriculum development
(Figure 10-1: right column → Part III, Figure 15-3)
Model 2: 14 Design Steps
(Figure 10-1: central column → Part III, Figure 15-4).

The project management model aids planning the development team and controlling the necessary resources. The model for curriculum design is the researcher's customized ISD-model and reflects the logical structure of the systematic approach. The activities supporting the relational approach intertwine with the steps for both models. The complete procedures for models of project management and design steps are described in Part III. The formats for the two models and their operating procedures are inspired by the texts of authors on curriculum design and development that were discussed in the preceding sections. Tracey's work (1971, 1984, 2nd edition) is particularly relevant. When the researcher started to develop curricula in 1974, Tracey provided the know how for entering a new profession (also see Kessels & Smit, 1982, 1984). The structure of his design model still influences our work. In addition, however, recent experiences, new insights and concepts have affected the specific elements and their operating procedures.

Many references are also made to Romiszowski (1981, 1984) and to Rothwell & Kazanas (1992). Romiszowski's analytical treatment of the heuristics in curriculum design supported the systematic approach. Rothwell & Kazanas' procedures for '*Mastering the instructional design process*' (1992), which are based on '*Instructional design competencies. The Standards*' (Foshay, Silber & Westgaard, 1986), provide valuable suggestions for both systematic and relational approaches.

Notwithstanding our recommendation of spiralic, iterative and cyclic procedures (Banathy, 1987), the models reflect a linear flow chart format, as the multitude of arrows denoting possible iterations and simultaneity would otherwise blur the desired clarity.

11 TRAINING DEVELOPERS

The preceding chapter provides a sequence of events and functions for tasks that lead to effective educational provisions. It offers operating procedures for identifying educational problems or needs and defining solutions by means of effective and efficient training and learning activities based on relevant objectives. However, availability of design standards does not ensure skilful application. The developer must put these procedures into action. Simply knowing about the standards is insufficient for verifying their value. It is a prerequisite that developers master the design standards, and above all, that they be motivated for applying these procedures in their own organizations. To that end, 30 developers registered for the course on instructional development of which the objectives are geared towards the skilful application of the design standards.

11.1 Leading characteristics

The course was taught to two groups of 15 participants. The leading characteristics are outlined below.

The training course took place over a period of eight months while participants devoted part of their time to projects to be implemented in their organizations. As the main features of the programme combined working on a project with being coached by two experienced developers and individual mentors (supported by guest lecturers on specific topics), it turned into a reflective practicum (Schön, 1987).

The participants were training officers, human resource managers and consultants for Dutch organizations. The criteria for enrolling in the programme were:

- the candidate's current position permits professional curriculum design;
- the candidate has been assigned to develop an educational programme;
- the candidate has a degree of higher education.

The two programme directors interviewed eligible candidates, and discussed the implications of the selection criteria, the objectives, as well as the facilities required for practical assignments.

Out of the 30 developers who started with the programme, two participants could not finish their projects due to illness.

11.2 Outline of the programme

The programme consisted of ten modules of two successive days each, distributed over eight months. Course materials comprised the design standards (Part III, first version), selected readings, and assignments for practical work. The programme directors arranged separate meetings with the participants' mentors. They discussed the objectives and the characteristics of the course, as well as the mentor's supportive role. Figure 11-1 shows the programme outline.

Modules and Programme Activities:	
1	Introduction Training Needs Assessment (Part I) Project Management and Planning Project Goals
2	Training Needs Assessment (Part II) Task Analysis Techniques Conducting task analysis at host company Presentation of findings to executives
3	Instructional Objectives Evaluation Criteria and Instruments for: - process level and formative evaluation - assessing results - assessing performance - assessing impact
4	Designing Learning Situations (Part I) - instructional strategies - developing course materials - application of media
5	Designing Learning Situations (Part II) - learning theories and instructional theories - blueprinting a programme design - applying instructional matrices - developing self-instruction packages

Modules and Programme Activities:	
6	Cost-Benefit Analysis - comparing alternative arrangements on the basis of costs and benefits Preparing a proposal and a presentation for an educational provision - case studies on organizational change and technical innovation
7	Training Needs Assessment (Part III) Presentation of a programme proposal to senior executives - hospital case study - industry case study
8	Interpersonal and Consulting Skills - assessment of personal effectiveness - interpersonal skills for obtaining commitment and support Cultural Diversity
9	Designing Management Development Programmes Designing Computer Training Programmes
10	Presentation and Assessment of Projects - presentation of each curriculum to three assessors Farewell Banquet

Figure 11-1: Programme outline of the course for developers

12 EMPIRICAL STUDY #2: 28 CURRICULUM PROJECTS

Study #2 may also be characterized as a multiple case study with multiple units of analysis. This second empirical study is a replication of the preceding case study as well as an evaluation study of the design standards. To that end, the hypotheses developed in Section 6.2 apply to this part of the research. The rival hypotheses are not included in Study #2. As the specific use of design standards is emphasised, the hypotheses slightly differ from those in Study #1. This is the reason why Hypothesis 1 of Section 6.2 has been restated as follows:

> Skilful application of design standards, based on both a systematic and a relational approach, will generate educational programmes that accomplish significantly better results than those of unsuccessful cases.

Variables:

Study #2 is based on the same variables and their constituting elements as Study #1. Therefore, the description of the variables in Chapter 7 also applies to this stage in the research project. There is one exception: in the variable Relational Approach the item of *adequate project management* has been added.

12.1 Procedures for data collection and analysis

This section provides an account for the major activities concerning data collection and data analysis. It includes the selection and instruction of assessors, two pilot assessments, and the data collection on curriculum design and on effects. The results will be presented in Chapter 13 and discussed in Chapter 14.

12.1.1 Data Collection

Data collection was conducted by means of an assessment manual for curriculum design applied by professional assessors (see Appendix VII)

and by means of questionnaires for (top) managers, supervisors, developers, trainers, and trainees to obtain data on perceptions of the initial problem and programme effects (see Appendix VIII). The questionnaires for managers, supervisors, developers, trainers and trainees essentially have the same format, although minor changes were necessary for the questions to apply to the specific situation.

The assessment manual was applied to pilot analyses by three assessors. The pilots tested whether the guidelines offered sufficient help in rating the adequacy and consistency of the various curriculum elements. These pilots led to revisions of the assessment manual, mainly rearrangements of the coding system for adequacy and consistency.

Data collection took place in three stages. The following procedures have generated values for the main variables and their constituting items.

- Stage 1: Assessment of Curriculum Design

a. In late May, 1992, the researcher received three copies of the files containing the curriculum documents for the 28 projects. Three independent assessors studied the documents and carried out a preliminary analysis guided by the assessment manual.

b. In June, 1992, for each of the 28 projects the three assessors and the developer of the project met to discuss specific features and aspects that raised questions during the preliminary analysis. After the interview the assessors completed the manual and submitted it to the researcher.

Systematic Approach is based on the scores for items: 1-A, 2-A, 3-A, 4-A, 5-A, 6-A, 7-A and 8-A of the assessment manual (Appendix VII).

Internal Consistency is based on the scores for items: 2-C, 3-C, 4-C, 5-C, 6-C, 7-C and 8-C (Appendix VII).

Relational Approach is based on the scores for items: 1-A, 3-A, 9-A, 10-A, 11-A, 16, 17, 18 and 19 (Appendix VII).

Cost-Benefit Analysis is based on the score for item 15 in the assessment manual (Appendix VII).

- Stage 2: Assessment of Effects

a. In October, 1992, for each programme developed, the researcher

sent out the questionnaires on effects (one to the top manager, one to the supervisor, one to the developer, one to the trainer and five to trainees). When two or more supervisors and/or trainers were involved, additional copies were provided.

b. In May, 1993, the last set of questionnaires was returned to the researcher. Sets arriving after that date could not be included in the analysis.

Effect is based on the actors' answers to the questionnaire (Appendix VIII):

= satisfaction → Question 2.
= acquisition of skills → Question 5
= improved performance → Question 6
= impact on work environment and department → Question 7
= impact on the organization → Question 9

- Stage 3: Assessment of External Consistency

The data on the external consistency were collected as follows:

a. The researcher collected the answers to Questions 1 and 4 of the questionnaires and entered them on a separate display for each project.
   Question 1: What instigated the development of this educational programme?
   Question 4: Which new skills should participants acquire in this programme?

b. For each (blind) project, three judges assessed the consistency between perception of managers, developers, trainers, supervisors and trainees. The judges assigned scores for the assessment of the consistency between pairs of actors and for overall consistency. The instructions for the judges are included in Appendix VI.

External Consistency is based on scores assigned by three judges for the 11 entries of Appendix VI:

a. For each judge, a sub-scale was constructed for the ten scores for the ten pairs of actors.

b. For each judge, correlations between sub-scale and overall score (11) were computed.

c. As the sub-scale α values and the correlations were high, a scale for external consistency was constructed on the basis of the scores for overall consistency assigned by the three judges.

12.1.2 Selection of assessors

24 assessors were invited from a group of training managers, consultants and academic staff. Each assessor was assigned to three projects. As some assessors were affiliated with competitors of the companies running the projects, conflicts of interest were screened. Potentially compromising combinations of assessors and projects were eliminated.

12.1.3 28 Designed curricula and 17 implemented projects.

In Stage 1 the assessors analysed the curriculum documents of 28 projects. However, in Stage 2 the questionnaires could be retrieved for only 17 projects. The developers reported on various circumstances responsible for this disappointing response. Due to internal restructuring of the organization and mergers, three projects had to be postponed when responsibilities and target groups had to be redefined. Two projects were not implemented because all training activities had to be cancelled or postponed due to the recession. Two projects were still in progress. No data on effects could be reported at that time. The activities for needs assessment, task analysis and creating favourable conditions for implementation finally convinced top management in two projects that major changes in the organization were necessary for successful implementation. The projects were postponed. One project was postponed because the system for which the programme was developed had not yet been implemented. Another project was postponed because the trainer went on maternity leave.

12.1.4 Reliability

In Study #2, the same criteria for acceptance and rejection of data were applied as in Study #1, jury $\alpha \geq .60$, scale $\alpha \geq .70$. Correlations are considered significant when $r \geq .40$, $p < .10$. The 10% probability level (for correlations, t values and F values) is justified by the small sample numbers. For the paired comparison of programmes in Section 14.3 F tests have been applied for the oneway analysis of variance, using the Scheffé procedure, known to be statistically conservative in generating significant outcomes. These procedures and precautions were taken to comply with reliability requirements.

13 RESULTS STUDY #2

This chapter presents the results of the second empirical study. The reliability of the criterion variable Effect is discussed as well as the values for the predictor variables. The chapter concludes with the comparison of implemented and postponed projects.

13.1 Reliability of Effects measures

Questionnaires were returned for 17 projects. The number of respondents per project varied from 1 to 12, of which an overview is included in Appendix X. The reliability of the effect measures was secured by applying the following criterion for accepting a project: at least 75% of the actors, of which the scores of at least four effect items are available, should show a jury $\alpha \geq .60$. Three projects did not meet that criterion and had to be rejected. The correlations between variables are therefore based on the 14 remaining projects.

For the Effect variable two scales have been constructed.
Scale 1: Effect-Total is based on the items: satisfaction, skills, performance, impact on work environment and department, and impact on the organization.
Scale 2: Effect-Performance is based on skills, performance and impact on work environment and department.
The Effect-Total scale is compared to the Effect values obtained in the case studies from Study #1. The statements of the actors in the case studies ranged from satisfaction to overall impact on the organization. The Effect-Performance scale reflects the outcome of the programme more accurately. While satisfaction is crucial for obtaining positive results, it is less relevant as a method of assessment. Although impact on the organization is the ultimate goal, too many factors come into play and inhibit an unambiguous relationship between training programme and impact. Therefore, the actors' perceptions of organizational impact will either be biased or deny impact. Furthermore, often organizations are too large and the target groups of the programme too small to effect organizational impact. Size limits the impact irrespective the quality of the programme.

The logic of the five effect items is that (in time) satisfaction facilitates the acquisition of skills, performance benefits from skills, performance has an impact on work environment and department, and work environment and department have an impact on the organization as a whole. The correlations between the five effect variables showed the following pattern:

	satisfaction	skills	performance	department
satisfaction				
skills	.04			
performance	.20	.79*		
department	.06	.38	.56	
organization	-.05	.36	.51	.77*

(*) denotes: significant $p < .001$

Apart from the pair *satisfaction* - *skills*, the pairs of adjacent Effect variables show the highest correlations. This pattern may be interpreted as an indication that the measure of an Effect variable over time is mainly influenced by the variable directly preceding it. Moreover, this empirical evidence supports the conceptual relationships between the Effect variables as described above.

13.2 Values of the main variables in projects

Table 13-I: Scale analysis in projects

Scale	$\overline{X}$	s	scale α
Systematic Approach	4.00	.46	.87
Internal Consistency	3.74	.52	.88
Relational Approach	3.85	.36	.89
External Consistency	3.25	.63	.75
Cost-Benefit Analysis	4.26	.46	jury α = .62 *
Effect-Total	3.59	.26	.73
Effect-Performance	3.60	.26	.82

* As the Cost-Benefit variable is based on one item, its reliability is expressed by the jury α of the three assessors.

On the basis of the values from the assessment manuals, the questionnaires, and the external consistency judgements, Likert scales have been constructed, in a way similar to Study #1. Table 13-I shows a summary of the scales. The full scales of the variables appear in Appendix IX.

Table 13-II: Values of main variables in projects

Project	Systematic Approach	Internal Consist.	Relational Approach	External Consist.	Cost-Benefit	Effects Total	Effects Perform.
4	3.78	3.67	4.00	4.00	3.33	3.10	3.17
5	4.06	4.07	4.17	2.67	4.00	3.11	3.06
6	4.83	4.80	4.63	3.67	4.33	3.70	3.67
9	4.22	3.80	3.58	3.67	4.33	3.84	3.72
10	3.33	3.47	4.33	2.67	5.00	3.58	3.43
11	4.22	3.93	4.25	3.00	4.67	3.62	3.58
12	4.22	3.40	4.13	3.67	4.33	3.47	3.39
16	4.83	4.67	4.83	4.00	4.00	3.81	3.80
18	3.33	3.07	3.92	2.33	4.67	3.40	3.57
21	4.28	4.07	4.13	4.00	4.67	3.72	3.87
22	4.11	3.87	3.54	3.67	3.67	3.91	3.92
23	4.61	3.73	4.50	3.67	4.67	3.92	3.90
24	3.94	3.53	4.08	3.00	4.00	3.47	3.62
26	4.39	4.07	3.88	3.67	4.00	3.63	3.65

The scales for the variables Systematic Approach, Internal Consistency, and Relational Approach are based on the data from 28 projects. The scale for the variable External Consistency is based on the data from the 17 implemented projects. The scale for the variable Effect is based on the 14 implemented projects where at least 75% of the actors, of which the scores of at least four effect items were available, showed a jury $\alpha \geq .60$. The low r_{it} .05 of the Satisfaction item in the Effects-Total scale justified the stronger Effects-Performance scale, where Satisfaction is

deleted. The intended comparison of cases and projects from the two studies, however, demands further analysis on the basis of the Effects-Total scale.
The values of the variables in the 14 implemented projects with reliable Effect measures appear in Table 13-II.

13.3 Comparison of implemented and postponed projects

As implementation has been postponed for 11 projects, experimental mortality might affect the findings. Therefore, the researcher was interested in whether the values for the variables Systematic Approach, Internal Consistency and Relational Approach of 17 implemented projects

Table 13-III: Implemented and postponed projects: *t* values

Projects *Scale:*	*Postponed* $n=11$ $\overline{X}$	s	*Implemented* $n=17$ $\overline{X}$	s	t	df	p
Systematic Approach	3.82	.64	4.00	.61	-.57	26	.712
Internal Consistency	3.74	.74	3.75	.69	-.03	26	.979
Relational Approach	3.68	.82	3.95	.57	-1.05	26	.305

Postponed and implemented projects do not differ significantly at $p < .10$

differed significantly from those in the group of 11 postponed projects. For both groups, the values of these three variables were available. For this comparison *t* tests were run for the two groups, and the results are presented in Table 13-III. Comparing the three variables shows that the 17 implemented projects do not deviate significantly from the 11 postponed at $p < .10$. Therefore, experimental mortality is not likely to affect the validity of the Effect values at hand.

14 CONCLUSIONS AND DISCUSSION STUDY #2

The main research questions addressed in the second empirical study are:

1. Which factors in curriculum design influence the quality of corporate education?
2. How do these factors operate?
3. Can they be influenced by skilful application of design standards?

To answer these questions, design standards have been developed on the basis of a literature search and the results of the preceding case study. Curriculum developers have studied these design standards and applied them to 28 projects in their organizations. During the research period, 17 projects were implemented, of which three had to be rejected due to low reliability of the Effect variable. The results appeared in the preceding chapter. This chapter relates the findings of the remaining 14 projects to the hypotheses. Furthermore, the findings are compared to those of the case study.

14.1 Conclusions

A general conclusion is that the projects show homogeneous values for the variables:

Systematic Approach	minimum 3.33, $\overline{X} = 4.00$, $s = .46$;
Internal Consistency	minimum 3.07, $\overline{X} = 3.74$, $s = .52$;
Relational Approach	minimum 3.58, $\overline{X} = 3.85$, $s = .36$;
External Consistency	minimum 2.33, $\overline{X} = 3.25$, $s = .63$;
Cost-Benefit Analysis	minimum 3.33, $\overline{X} = 4.26$, $s = .46$;
Effects-Total	minimum 3.10, $\overline{X} = 3.59$, $s = .26$;
Effects-Performance	minimum 3.06, $\overline{X} = 3.60$, $s = .26$;

Only the variable External Consistency is < 3.00 for three projects (projects 5, 10, 18). The variable Cost-Benefit Analysis is < 4.00 for all but three projects. Regarding the Effects variables, the 14 projects have succeeded when the same criterion for success is applied as is in the case study (> 3.00). This homogeneous achievement is rewarding to the group of developers and their organizations, but the limited variance in the data caused psychometric problems for the researcher. Between Relational Approach and External Consistency no substantial correlation could not be established due to small variances, $s = .36$ and $s = .63$.

This was also the case with the correlation between Relational Approach and Effects, $s = .36$ and $s = .26$.

14.2 Findings related to the hypotheses

To relate the findings to the hypotheses, the relevant correlations between variables have been computed. The significant correlations ($r \geq .40$, $p < .10$), appear in Table 14-I. On the basis of these findings and their correlations, the hypotheses are examined and discussed in relation to the conceptual framework. For detailed analysis of the correlations the 14 projects were divided into two groups on the Effect-Total variable: 9 high performance projects (Effect > 3.50) and 5 satisfactory projects (Effect < 3.50). In the first study the criterion for dividing successful and unsuccessful cases was Effect $\overline{X} = 3.00$. None of the projects showed an Effect value < 3.00. The criterion Effect $\overline{X} = 3.50$ forced a split between 5 satisfactory and 9 high performance projects. The probability level of $p < .10$ is justified by the small numbers of projects, $n = 14$, $n = 9$, and $n = 5$.

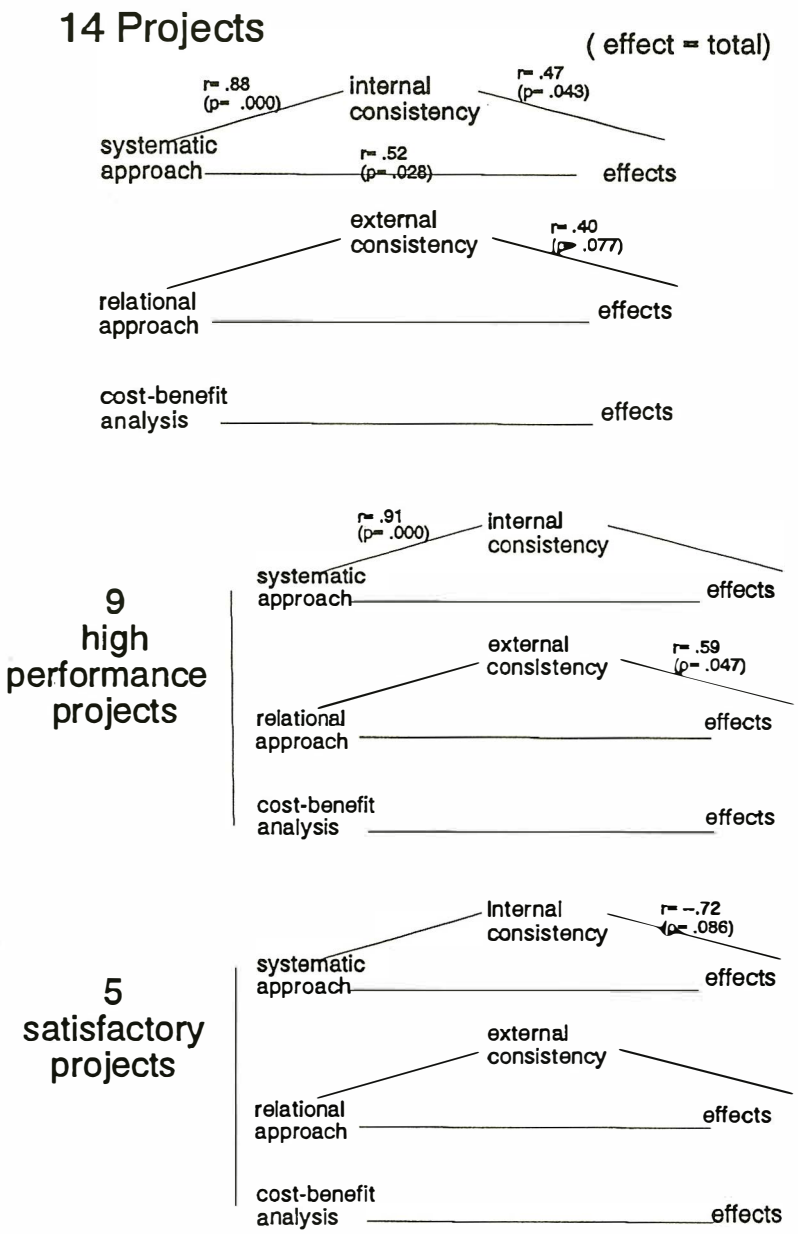
Hypothesis 1:
Design standards advocating a systematic approach lead to internally consistent formal curricula.

In the total group the correlation between Systematic Approach and Internal Consistency is $r = .88$, $p = .000$. In the high performance projects this correlation is $r = .91$, $p = .000$. This hypothesis should not be rejected.
The case study shows similar high correlations: $r = .87$, $p = .000$ for the total group, and $r = .81$, $p = .004$ for the successful cases.

Hypothesis 2:
Internal consistency of the formal curriculum and programme effects are related positively.

In the total group the correlation between Internal Consistency and programme Effects is $r = .47$, $p = .043$. The satisfactory projects have a negative correlation $r = -.72$, $p = .086$. This hypothesis should not be rejected.
These figures indicate that Internal Consistency and the related Systematic Approach probably have to be embedded in a prerequisite condition to be effective. These findings form a basis for a plausible explanation

Table 14-I: Correlations between main variables in projects



that further efforts to obtain internal consistency of the formal curriculum might become counterproductive when the design process does not satisfy the prerequisite elements of the relational approach and external consistency.

Hypothesis 3:
Design standards advocating a relational approach lead to external consistency (homogeneous ideas and perceptions among parties involved on the nature of the problem and possible solutions).

No significant correlations were found for this hypothesis. All the correlations found were close to 0. This might indicate that the hypothesis should be rejected. Compared to the case study, this shift is dramatic (Cases: Relational Approach → External Consistency $r = .54$, $p = .013$; Relational Approach → Effects $r = .86$, $p = .000$).
A plausible explanation for this deviant pattern is as follows:
In view of the strong correlations found in Study #1, it is unlikely that there is no empirical evidence for the theoretical construct of the relational approach and its presumed impact on external consistency and effects in the projects of Study #2. The deviant pattern may be of psychometric origin. The variance of the Relational Approach is too small ($s = .36$) to obtain substantial correlations.
In view of the findings in the case studies and the small variance of the variables, it is justified not to reject the hypothesis.

Hypothesis 4:
External consistency and programme effects are related positively.

In the total group, the correlation between External Consistency and Effects is $r = .40$, $p = .077$. In the high performance projects, this correlation is $r = .59$, $p = .047$. This hypothesis should not be rejected.
In view of the preceding discussion on negative correlation between Internal Consistency and Effects in the satisfactory projects, and the importance of External Consistency in the high performance projects, these findings too might indicate that External Consistency is a prerequisite for internally consistent formal curricula to be effective and, ultimately, for successful implementation.

Hypothesis 5:
The relational approach compensates for weaknesses in the systematic approach.

When weakness of the systematic approach is defined as < 3.00, this hypothesis does not apply to any of the projects. No empirical data are available for testing this hypothesis.

Hypothesis 6:
The systematic approach does not compensate for weaknesses in the relational approach.

When weakness of the relational approach is defined as < 3.00, this hypothesis does not apply to any of the projects. No empirical data are available for testing this hypothesis.

Hypothesis 7:
Though cost-benefit analyses are important for selecting efficient solutions to educational problems, they are not related to programme effectiveness.

As no significant correlations between cost-benefit analysis and effect could be found, this hypothesis should not be rejected.

Hypothesis 8:
Skilful application of design standards, based on a systematic as well as on a relational approach, will generate educational programmes that accomplish significantly better results than those of unsuccessful cases.

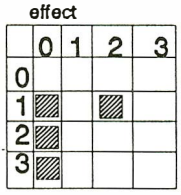
The minimum value found for the Systematic Approach is 3.33. The minimum value for the Relational Approach is 3.58. These values justify the conclusion that in all projects the systematic approach as well as the relational approach have been skilfully applied. In the case study, the criterion for success is Effect > 3.00. All projects in the second study present Effect values > 3.00. Provided that it is permissible to compare the Effect values of the two studies, the conclusion that skilful application of the design standards generates educational programmes that accomplish results that are significantly better than those of unsuccessful cases, is justified. This hypothesis should not be rejected.

14.3 Comparison of cases and projects

For a more detailed analysis of the cases from Study #1 and the projects from Study #2, the successful and unsuccessful cases were compared with the high performance and satisfactory projects. The following labels denote the four groups of programmes:
- Group 0: unsuccessful cases $n = 8$
- Group 1: successful cases $n = 9$
- Group 2: satisfactory projects $n = 5$
- Group 3: high performance projects $n = 9$.

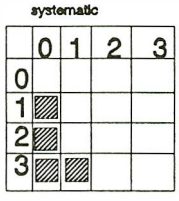
To determine whether one group performed significantly better than another, paired analysis of variance was applied by means of F tests and the Scheffé procedure ($p = < .10$). The full F tests for the main variables appear in Appendix XI. Analysis of the F values justifies the following interpretations and resulting conclusions:

Effect: $F\ (3, 27) = 41.02, p = .000$



1. Group 1 performs significantly better than Groups 0 and 2.
Groups 2 and 3 perform significantly better than Group 0.
As far as the Effect variable is concerned, the projects perform significantly better than the unsuccessful cases. Therefore, Hypothesis 8 should not be rejected.
2. The successful cases are significantly more effective than the satisfactory projects. This finding is due to the division within the projects. The Effect variable of the five satisfactory projects has a small range from 3.10 to 3.50.

Systematic Approach: $F\ (3, 27) = 17.67, p = .000$

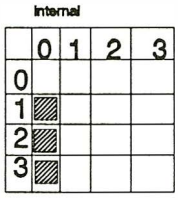


3. Group 3 performs significantly better than Groups 0 and 1.
Groups 1 and 2 perform significantly better than Group 0.
The high performance projects applied a significantly better Systematic Approach than the successful cases, but they did not significantly surpass the satisfactory projects in Effect as the successful cases did. The extra efforts in Systematic Approach did not lead to proportionally better effects.

Internal Consistency: F (3, 27) = 14.76, p = .000

4. Groups 1, 2 and 3 perform significantly better than Group 0.

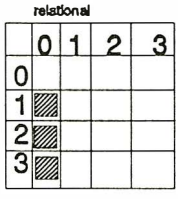
This observation is consistent with the expectations.



Relational Approach: F (3, 27) = 56.47, p = .000

5. Groups 1, 2 and 3 perform significantly better than Group 0.

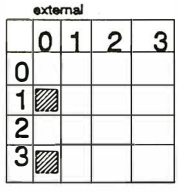
This observation is consistent with the expectations.



External Consistency: F (3, 27) = 6.04, p = .003

6. Groups 1 and 3 perform significantly better than Group 0.

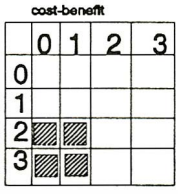
7. Successful cases and high performance projects presented significantly greater External Consistency than unsuccessful cases and satisfactory projects. Although successful cases, high performance, and satisfactory projects did not differ significantly in efforts towards a Relational Approach, the External Consistency in the successful cases benefitted most from these efforts.



Cost-Benefit Analysis: F (3, 27) = 18.05, p .000

8. Groups 2 and 3 perform significantly better than Groups 0 and 1.

The projects benefitted from the instructions on Cost-Benefit Analysis, but this had no impact on Effect.



Reflection

The variables Effect, Internal Consistency and Relational Approach form patterns among the cases and projects that fulfil the expectations at the outset of the research project: the projects perform significantly better on

these variables than the unsuccessful cases. However, two major patterns of deviation exist:

a. The high performance projects surpass the successful cases in Systematic Approach, but not in Internal Consistency. The conceptual framework, in which Systematic Approach and Internal Consistency are closely related does not suggest this result.
Furthermore, the high performance projects do not significantly surpass the satisfactory in Effect. The successful cases do surpass the satisfactory projects in Effect. Apparently, comparing successful cases and high performance projects, the significant extra efforts in the Systematic Approach of the projects do not result in a significantly better Effect.

b. The successful cases, high performance and satisfactory projects do not differ significantly on the Relational Approach, although, among these three groups, the satisfactory projects do differ in External Consistency. The conceptual framework, in which Relational Approach and External Consistency are closely related does not suggest this result. This finding indicates that additional efforts in the Relational Approach do not proportionally increase External Consistency.

The pattern of External Consistency might imply that this variable most accurately predicts excellent programme effects, as perceived by the various actors.

Regression analysis

Before drawing final conclusions and answering the overall research questions, we conducted a regression analysis on the variables Systematic Approach, Internal Consistency, Relational Approach and External Consistency in relation to the Effects. To that end, cases and projects were combined to obtain a larger group with greater variance. Table 14-II depicts the correlations between these five main variables in the 31 programmes (17 cases and 14 projects).

The four regression lines for the 31 programmes are depicted in Tables 14-III and 14-IV. The coefficients of these analyses are listed below:

Table 14-II: Correlations between main variables in 31 programmes

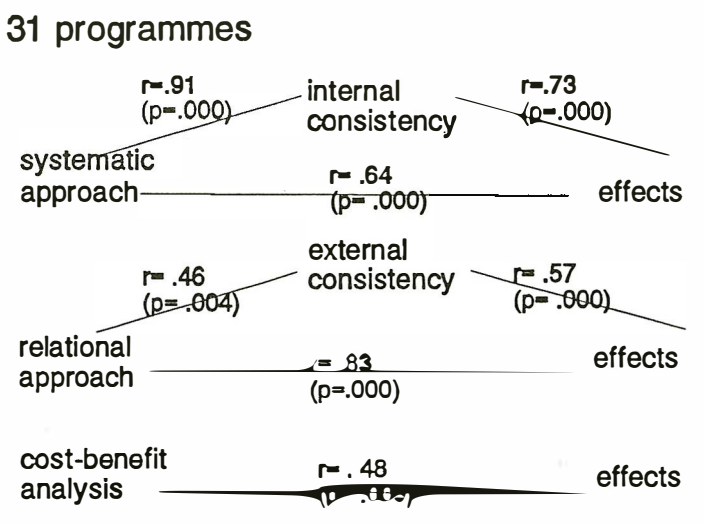
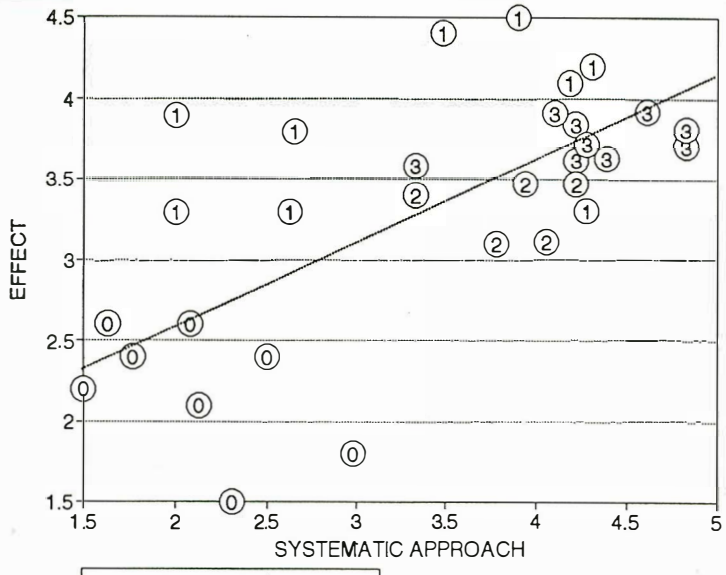


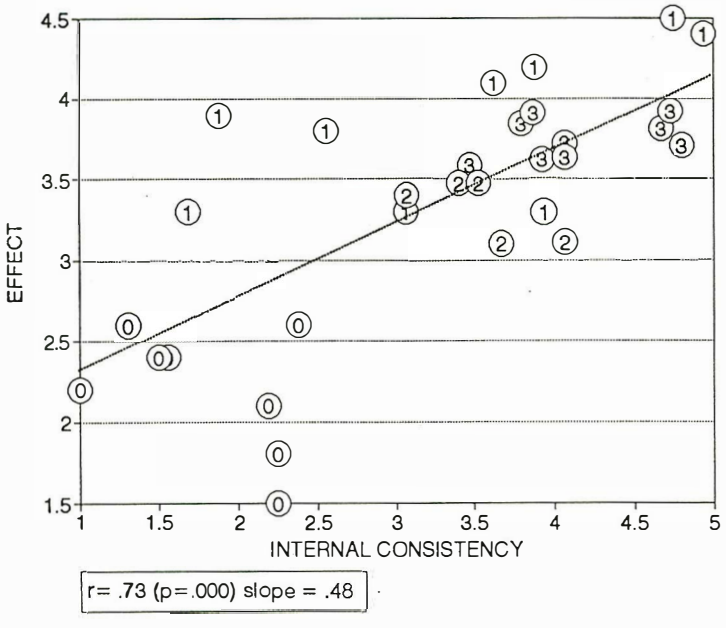
Table 14-III:
Systematic Approach to Effects: $r = .64, p = .000$, slope = .47.
Internal Consistency to Effects: $r = .73, p = .000$, slope = .48.

Table 14-IV:
Relational Approach to Effects: $r = .83, p = .000$, slope= .54.
External Consistency to Effects: $r = .57, p = .000$, slope= .54.

These variables correlate significantly with Effects, but the Relational Approach and External Consistency lines have slightly steeper slopes than the Systematic Approach and the Internal Consistency lines. The steepness of the slope for External Consistency supports the foregoing conclusion that External Consistency predicts most accurately the effects of an educational programme.

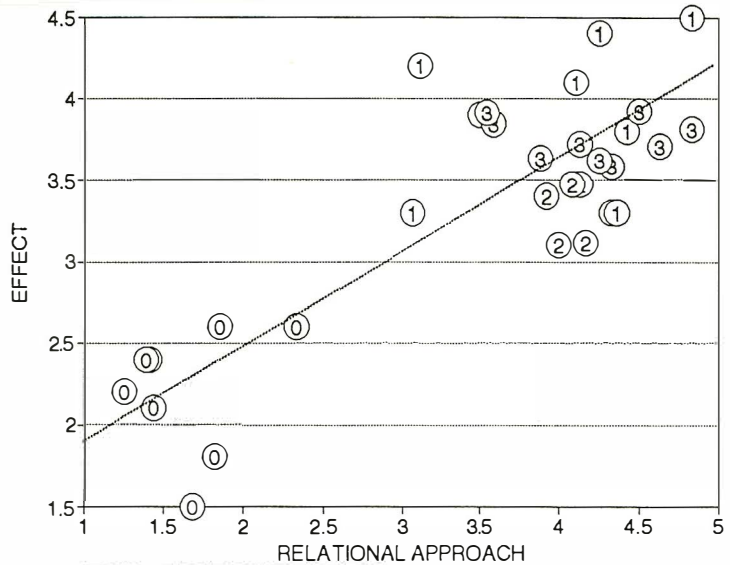
Table 14-III: Regression analysis of Systematic Approach, Internal Consistency and Effects

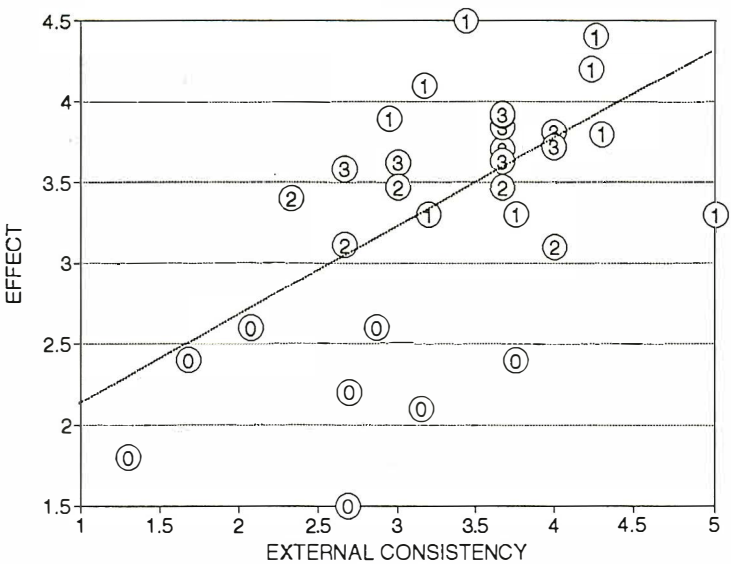




0=unsuccessful, 1=successful case; 2=satisfactory, 3=high performance project.

Table 14-IV: Regression analysis of Relational Approach, External Consistency and Effects





0=unsuccessful, 1=successful case; 2=satisfactory, 3=high performance project.

14.4 Methodological considerations

Construct validity and concurrent validity
One of the questions that arises is whether the labels of variables used in the second study on projects cover the same constructs as those in the case studies (Study #1). This is crucial for the comparisons between the two studies and for the regression analysis that is finally performed on the values of all 31 programmes. To answer this question, two aspects should be considered:
a. Do the data-collection instruments cover the same items?
b. Are the procedures for data collection and analysis identical?

As to Question a: with one exception, the data collection *instruments* do cover the same elements in both the case studies and the projects. In the projects, curricula have additionally been assessed on *adequacy of project management* (item 16 of the assessment manual, Appendix VII). This item is on the scale of the Relational Approach. This item was not explicitly included in the data collection protocol for the cases. As the values of the variables are based on the construction of scales subjected to strict scale α's (for Relational Approach $\alpha = .89$), inclusion of the project-management item with a high $r_{it} = .78$, will not impede the reliability of the comparison of cases and projects.
Appendix XIII includes a matrix on the related items of the various data collection instruments in the two studies.

The answer to question a is: except for the project-management item, the data collection instruments cover the same items in both studies and permit comparing cases and projects.

As to Question b: the data collection *procedures* in the two studies are not identical.

Cases:
The data for the cases are collected during interviews with the various actors. The analysis of the validated interview minutes proceeded as follows:

- Coded text chunks have been transposed to displays; the display sections for the items belonging to the Systematic Approach, Internal Consistency and Relational Approach have been rated by the researcher.
- The related items in the data collection protocol have been rated by two analysts.

- The display sections on External Consistency have been rated by three judges.
- The display sections on Effects have been rated by two groups of training professionals.

Projects:
In the projects, the items on Systematic Approach, Internal Consistency and Relational Approach have been rated by three training experts who studied the curriculum documents and interviewed developers.
Data on External Consistency (actors' statements on the nature of the problem and possible solutions) were collected by means of questionnaires, transposed to displays and rated by three judges.
Quantitative data on effects were collected by means of questionnaires.

The differences between the data collection procedures for the two studies can be evaluated as follows:
For the variables Systematic Approach, Internal Consistency and Relational Approach:
In the projects the data for these variables were directly collected and rated by expert judges. But the data are based only on curriculum documents and interviews with the developers. In each case study, data collection and rating involved the investigator (the data collector), two data analysts and the researcher. Moreover, in the case studies data were not only collected from documents and developers, but also from managers, supervisors, trainers and trainees. Especially for the variable Relational Approach, these multiple sources offered data in a broader perspective. These varied sources are also a reason why the findings on the Relational Approach in the case studies justify generalized conclusions on this variable, in spite of the absence of similarly significant findings for the projects. For the Systematic Approach and the Internal Consistency comparison between cases and projects is justified without hesitation, as both studies emphasized the examination of curriculum documents.

For the variable External Consistency:
The only difference between the two studies is that in Study #1 statements were collected by means of interviews and in Study #2 by means of open-ended questions in questionnaires. In both studies the researcher has displayed the statements. Consistency of the 10 pairs of statements is rated by the same three judges that participated in Study #1 and Study #2. These procedures justify comparison of the values for External Consistency in the two studies.

For the variable Effects:
In the projects, the Effect variable has been rated directly by the five categories of actors in the questionnaires. In the case studies, rating of actors' statements took place by two groups of professionals (Experts: α = .92 and NVvO: α = .89; inter rater agreement of the two groups r = .85). The respective α values and agreement between raters justify comparison of the values for the Effect variable between cases and projects.

Through this reasoning the researcher inferred the concurrent validity between the data collection instruments and analysis of the two studies. This concurrent validity allows for comparison between cases and projects and for performing a regression analysis of the main variables in the 31 programmes under review.

External validity
In addition to the observations in Section 9.5 on literal and theoretical replication of the case studies, an alternative way of reasoning can be used to determine whether the conclusions of this study may be generalized to corporate education in general despite the absence of random sampling.

When compared to single case study research and N=1 experiments the recurrent findings in the 17 case studies and 14 projects allow for generalizing these findings to a larger universe. However, studies done on small numbers of samples such as 17 and 14 may not allow for powerful statements on significance in statistical terms. When such statistical significance is found in a small sample study, however, its relevance is quite important (Stokking, 1984, p. 182). As randomized sampling was not feasible in the two studies

> '... any group of cases can be considered a random sample from a hypothetical infinite population of all possible samples that could have been generated under equivalent circumstances.' (Morrison & Henkel, cited by Stokking, 1984, p. 199).

This statement implies that generalizing conclusions need not always be justified by numerical universality (Stokking, 1984, p. 199) or by statistical replication (Yin, 1989, p. 21 and p. 43). In this study, generalization on the basis of analytical replication is justified by specific patterns observed across the four groups of programmes: successful and unsuccessful cases, and high performance and satisfactory projects.

It could also be argued that the conclusions on the application of systematic and relational approaches, and the design standards in particular, are not valid for all categories of training programmes in corporate education. The matrix in Table 14-V exhibits the types of programmes included in the two studies. (Servicing competencies apply to customer relations, administrative procedures and quality control.) Justification of the general application of design standards, irrespective of the programme's subject matter, is based on the wide variety of programmes in this overview.

Table 14-V:
Overview of types of programmes

Competences:	Cases	Projects
Technical	4	-
Interpersonal	4	3
Automation	5	2
Servicing	3	6
Management	1	3

Regarding the limitations of sample size, it should be considered that large-scale in depth studies will not be feasible in the context of corporate education. Complexity and accessibility of the field, and the necessary resources force researchers to operate on a modest scale when conducting such studies. Statistical significance and numerical universality will remain difficult to achieve.

14.5 Answers to the general research questions

The aim of this study is to develop a prescriptive theory and validated design standards for corporate education. It addresses the following research questions:

1. Which factors in curriculum design influence quality in corporate education?
2. How do these factors operate?
3. Can design standards control these factors?

The questions will be answered here, to the extent permitted by the limitations of the study:

Question 1:
Which factors in curriculum design influence quality in corporate education?
A theory on curriculum consistency has been developed in the conceptual framework. Its paradigms are:

A. Systematic Approach
A systematic approach generates logical contingencies among purpose, objectives, evaluation criteria and instruments, and the instruction presentation. The systematic approach effects an internally consistent formal curriculum and enables powerful educational interventions. Consequently, an internally consistent curriculum enables the acquisition of new skills, improvement of performance and a positive impact on the work environment.

B. Relational Approach
A relational approach stimulates management involvement and team work during the design and implementation process. It engages trainers with practical experience in the subject matter field and facilitates learning situations that resemble the work environment. The relational approach generates external consistency, defined as homogeneous notions of the parties involved, on the nature of the problem and possible solutions through educational provisions. When managers, supervisors, developer, trainers, and trainees share coherent opinions about the purpose and strategy, their efforts will lead to successful programme implementation, favourable transfer conditions and positive effects.

The research findings have inferred empirical evidence for the operation of the systematic and the relational approaches. Practical experience of the trainer and external consistency appear to be conditions for internally consistent curricula to become effective. Moreover, without these prerequisites, an internally consistent curriculum can become counterproductive.

Question 2:
How do these factors operate?

The systematic approach involves a logical and intellectual endeavour. The developer collects data on the desired outcome, and the target group, analyses, draws up a plan, selects instructional strategies and constructs course materials. Intellectual versatility and skilful application of instructional theory are major ingredients.

The study shows that efforts to take a systematic approach proportionally increase the internal consistency of the curriculum. Internal consistency of the formal curriculum and programme effects are related positively.

The relational approach involves social intervention and skilled communicative interaction. The developer organizes meetings and interviews managers, supervisors, employees, potential trainees and trainers. These procedures entail consulting with concerned parties, problem solving, negotiating, reaching a consensus, gaining support, and strategically applying gentle pushes and decisive pulls. The goal of these efforts is to achieve a consensus among parties involved on methods of solving the problem, implementing the programme, and creating favourable transfer conditions in the work environment.

The study shows that the relational approach, external consistency and programme effects are positively related. The creation of favourable conditions for implementation, adequate selection of trainers, coaches and trainees, project management, and involvement of line management are essential elements in the relational approach.

Question 3:
Can design standards control these factors?

The developers that participated in the second study were trained in the application of design standards, that emphasise both the systematic and the relational approach. Experienced specialists with excellent reputations in the training profession assessed the curricula they developed. The average values for the Systematic and Relational Approaches and for Internal Consistency as well as those of their constituting elements were all satisfactory. When we investigated the effects of the programmes, all projects passed the criterion for success. All but three projects satisfied the criterion for External Consistency.

Cost-benefit analysis is the easiest factor to influence by design standards. The values for the adequacy of this variable were among the highest. This result was surprising, as the preceding case study showed very poor performance on this item. However, the cost-benefit analysis does not have a significant impact on programme effects.

> The procedures for systematic curriculum design were adopted successfully and generated programmes with high internal consistency. This quality has a distinct impact on effects, provided the programme is embedded in an externally consistent environment.

The procedures that encouraged the developer to apply a relational approach were implemented properly. Unfortunately, their intended impact on external curriculum consistency could not be measured, because the variance in the data was too small. Nevertheless, comparable achievements in the case study clearly show effects on external consistency and programme outcome.

> External consistency appears to be of predominant importance for successful programme implementation. Moreover, this characteristic is not unilaterally affected by activities carried out by the developer.

A positive climate for learning and an active corporate education policy are likely to enhance external curriculum consistency. A developer cannot change these factors within the framework of a single curriculum design. Over time, reiteration of integrated curriculum design will probably lead to external consistency and thus enhance positive effects.

In view of the preceding findings, the answer to the third research question is affirmative. The design standards with which the developers were provided could be mastered within a period of eight months and successfully applied to their projects.

> The curriculum projects performed significantly better than the unsuccessful cases as to Effect, Systematic Approach, Internal Consistency, Relational Approach and Cost-Benefit Analysis.

In addition to these observations, it should be stated that this study only investigated the programme effects when design standards were being applied deliberately. For most developers this project was the first they ever developed according to prescribed operating procedures. The findings do not predict whether the developers of this study will continue applying these design standards in future projects.

> External consistency is a prerequisite for optimal benefits from the formal curriculum. It appears, however, that external consistency does not increase in proportion to the amount of energy the developer puts into the relational approach. The organization must also react positively to the developer's efforts. It really does take two to tango.

In the framework of a single programme, the developer is unlikely to achieve high external consistency when the organizational system fails to respond. Management involvement and close links with the work environment are essential for establishing external consistency. If the training function is isolated or has a negative image, the first attempts at a relational approach will not automatically result in strong external consistency and consequently in effective programmes. It is obvious that, apart from the inductive activities of a single programme developer, an organization will benefit most from the relational approach when the educational policy at the managerial level advocates an integrated curriculum design. Thus, quality in corporate education is not solely dependent on skilful application of relational and systematic approaches of the developer, but especially on the organizational climate in which an integrated educational strategy can flourish.

14.6 Revision of the Design Standards

At the outset of the research project the intention was to revise the design standards on the basis of the findings of empirical Study #2. In the study, experts assessed the curriculum documents and rated 26 aspects on a five-point scale (1 = highly inadequate/inconsistent, 5 = highly adequate/consistent. See the assessment manual in Appendix VII). The criterion for revision was $\overline{X} < 3.50$. No items failed to meet this standard. The item with the lowest score, $\overline{X} = 3.57$, was the consistency aspect of Item 5:

Have evaluation criteria been established to determine whether the curriculum has reached its goals?
Do the evaluation criteria for learning results reflect the instructional objectives?
Do the criteria for performance and impact reflect the training need?

In the revised version (Part III) this item has been amended. Furthermore, the developers' course has been adapted as regards this complicated area.

Furthermore, the developers were asked to evaluate the design standards. In addition to enthusiastic responses, some alterations on layout and sequencing were recommended. During the research project, the design steps were also evaluated in a separate study by Douw (1992). She designed and implemented an induction course for employees of Rabobank Nederland and tested the practicality of the design steps. The revised version has adopted the developers' suggestions, as well as some of Douw's recommendations. In the final version, each design step concludes with a paragraph of references. In the developers' course, a selection of these reference materials were supplied. Hopefully, the expanded version included will stimulate further inquiry and encourage colleagues to contribute.

14.7 Suggestions for further research

> 'It would be a mistake to close this volume by repeating the banal motto that more research is needed. Of course more is needed. But, more to the point, what is needed is the daring and freshness of hypotheses that do not take for granted as true what has merely become habitual' (Bruner, 1966, p. 171).

Bruner's invitation to formulate daring and fresh hypotheses that go beyond what we take for granted is a difficult but challenging task. The study raises some questions, as we came across some phenomena that prompted further inquiry.

The original hypothesis on the compensating quality of the relational approach has to be restated in the sense that it not only compensates for weaknesses in systematic design, but is also a prerequisite for a systematic design to become effective. Without this prerequisite, the systematic approach and internal consistency may even become counterproductive. Professional curriculum design should avoid such inefficiencies. Due to rapid and dynamic changes, there is a need for more productive design procedures. In addition, managers often complain about lengthy and costly curriculum design projects.

In their study on cost indicators of curriculum design, Nijhof, Mulder & Van Wijk (1992, p. 33) concluded that the use of a specific instructional design model appears to increase the labour costs for training development. They consequently questioned the relevance and value of using these models for developing educational programmes. Of course, the more elaborate the design procedures, the more labour from the developer is required in applying them. Labour cost of curriculum design in itself is of minor importance, as long as the investment yields results in effective programmes and in efficient alternatives. The justification of the design costs is discussed in Section 15.4. However, further research should reveal plausible design inefficiencies.

The multiple case study draws attention to another potential source of inefficiency in curriculum design. Programmes in which one individual was both trainer and developer did not fare significantly better or worse than those in which two individuals held these positions. However, the internal consistency of programmes with a separate developer was significantly greater. In the discussion we offered a plausible explanation for this phenomenon. Professional developers tend to be more proficient designers than trainers. Nevertheless, the fact that these internally consistent programmes did not perform better was explained by the absence or weakness of external consistency. Once again, we have probably touched on the limitations of rational curriculum design. On the other hand, in addition to these observations on internal consistency, it should be taken into account that, by its definition, external consistency increases when trainer and developer are one individual. Apparently, this specific increase does not have an impact on effect.

Both for practical reasons and from a theoretical point of view, it is relevant, to find the optimal input for relational and systematic approaches. This would allow for considerable shortcuts to be made in the development process without jeopardizing the desired effects. This study provided credible directions for finding an optimal input. External consistency appears to be of prime importance, although it is difficult for a relational approach coming exclusively from the developer to be effective. We hypothesize that curriculum design should be embedded in a positive educational environment to benefit an organization. On the formal side, a sophisticated education policy supports such a climate. Informally, personal commitment by top managers seems crucial. Both aspects merit further study.

This study has not questioned the foundations of internal consistency (the logic contingencies among purpose, objectives, evaluation criteria and instruments, and instructional strategies). Whereas external consistency is viewed as conditional, internal consistency is considered the driving force behind a curriculum. It might, however, be interesting to investigate curriculum design procedures that are not rigorously rational and strive for logical contingencies in the formal curriculum. If curriculum design were also perceived as professional artistry, additional categories of design principles would be explored, for example:

- the learning situation mirrors the work environment
- the manager is the prime educator
- the trainer is an experienced colleague
- trainer and trainee agree on the importance of their educational encounter.

These principles were discussed in the context of the relational approach (in Section 5.3), but the research design did not permit separate statements on each of these postulates detached from the framework of the systematic approach. Of course, the application of these relational design principles should be applied in a systematic way, but emphasis would primarily be put on the dynamics of the interactional context of curriculum design. The findings of the present study justify the conclusion that in striving for quality in corporate education, gaining external curriculum consistency should be a high priority. The findings also support the conclusion that Fullan's adaptive approach (referred to in Section 3.3) prevails the fidelity approach. As a consequence, design standards that strive for an internal, rigid logic, but meanwhile hinder the integration of the actors' interests, values, believes and priorities (external consistency), should be abolished and replaced by mainly intervention strategies focusing on the interpersonal dynamics of educational decision-making: pro-

cedures that aim at reaching a consensus on the practical implications of the above mentioned alternative design principles. In particular, professional curriculum designers (not being the trainer), should be alerted not to focus unilaterally on the structured and internally consistent formal curriculum. Curriculum development should be regarded, more than up till now, as a social enterprise. Therefore, developers should elaborate on their management role within that social enterprise of the educational decision-making process.

Thus, the end of this study states some 'daring and fresh hypotheses that do not take for granted as true what has merely become habitual' (Bruner, 1966, p. 171):

- Curriculum development that unilaterally focuses on internal consistency and neglects external consistency may create a major source of design inefficiency.

- Effective educational provisions are not constructed, but negotiated.

- To become effective, curriculum development should be embedded in a positive educational environment. Such a climate is supported by a formal and sophisticated education policy, as well as by informal and personal commitment of top managers.

- Successful curriculum designers are above all competent social engineers, who skilfully manage the social enterprise of educational decision-making.

PART III DESIGN STANDARDS FOR CORPORATE EDUCATION[1]

[1] I want to thank Lee Mitzman for translating the design standards, which were originally written in Dutch.

15 DESIGN STANDARDS FOR CORPORATE EDUCATION

Introduction

This study aims to develop a set of practical design standards that can be used in corporate education. Economic, social and cultural turbulence in society result in a continuous need to adapt to an ever-changing environment. Learning is considered a major vehicle for organizations to implement structural, technological and cultural transformations necessary for growth, or at least survival. Curriculum design plays an important role in creating an educational environment to satisfy the need for learning.

Design standards in corporate education focus primarily on the acquisition of skills that are sustained by the work environment. These skills are expected to bring about intended changes in an employee's performance and to have an impact on the organization. Therefore, in corporate education, curriculum is defined as:

- the course of action open to an organization
- for influencing the necessary skills of employees,
- that contribute to goal-oriented changes in their performance and in their work environment,
- thus striving for a desired impact on the organization
- by applying planned learning activities and the resulting learning processes.

The main purpose of developing and applying design standards is to improve the internal consistency of a curriculum and to achieve strong external consistency between the curriculum perceptions of managers, supervisors, developer, trainer and trainees, thus resulting in an attained curriculum congruent with the ideal curriculum.

The theoretical underpinnings of these standards have been explored in a conceptual framework of curriculum consistency and tested in two empirical studies. In Study #1, evidence has been inferred on the dynamics of the systematic and the relational approaches, as well as on the related constructs of internal and external consistency. In Study #2, 30 developers successfully applied a draft version of these standards and evaluated their practical usefulness.

The set of revised design standards presented here strives to meet the following conditions:

a. The theoretical foundations have been translated into practical instructions without invalidating the underlying paradigms.

b. The procedures are applicable by developers whose prime interest is to obtain an efficient tool for educational problem solving in the specific context of their organization.

c. Though developing educational programmes must be regarded as a professional occupation that requires dedicated training, these design standards are moulded in a format that serves as a job aid for the less experienced.

These standards should not be viewed as the final answer to designing educational programmes. Developers are invited to add successful procedures and approaches to be used by colleagues in future projects.

15.1 Goal and Principles

These design standards aim to generate a formal curriculum that will provide an adequate solution to a specific educational problem in an organization.

The approach is based on the following principles:

Problem - Goal

A specific problem that may be solved through a planned learning process must exist within the organization. It is therefore necessary to state the problem in terms of an attainable goal. While the problem may involve an existing situation, it may also concern a potential problem or one that might result from failing to perform certain tasks.

Work environment

It is necessary to describe clearly the employees' ideal work environment after solving the problem and achieving the goal. The main purpose of corporate education is to implement changes desired in the participants'

work environment. It is therefore useful to design learning situations only when it is known which changes in the work environment are necessary to attain the goal.

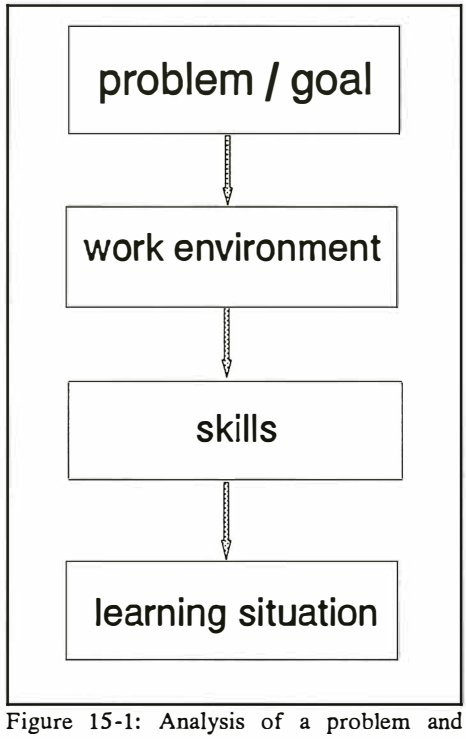


Figure 15-1: Analysis of a problem and design of appropriate learning situations

Skills

It is necessary to stipulate which of the employees' skills will bring about the desired changes. Knowledge and insights will not lead to change unless these qualities result in skills that enable employees to achieve the changes desired. The results of the intended curricula should therefore be expressed in terms of skills.

Learning situations

The design of the learning situations should enable employees to acquire skills necessary to make the desired changes in the work environment, thereby achieving the primary goal and solving the underlying problem.

Figure 15-1 shows how these four principles relate to one another: analysis of a problem and design of appropriate learning situations.

Evaluation

Evaluation of the curriculum analyzes the same relationship but reverses the order. The learning situations are designed to generate a learning process of which the results consist of the skills deemed necessary. These skills serve to influence performance so that changes occur in the work environment that not only have an impact on but also provide a solution to the original problem.

Figure 15-2 shows the relationship between process, results, performance

and impact. Evaluation of the impact of learning processes on the original problem.

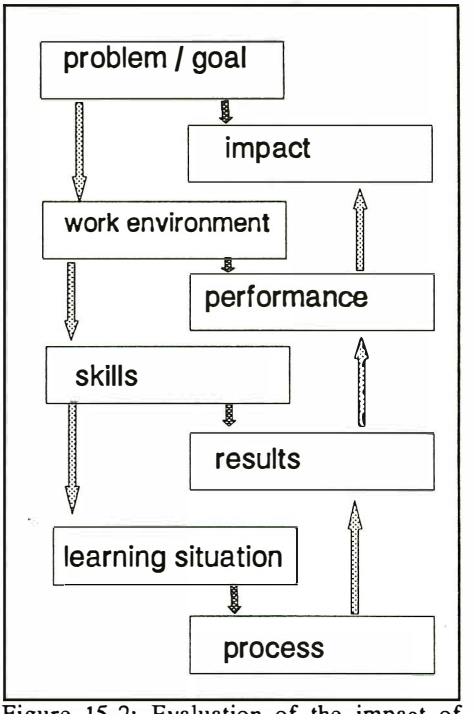


Figure 15-2: Evaluation of the impact of learning processes on the original problem.

Involvement of line management

Involvement of the trainees' supervisors in designing and implementing the curriculum is crucial to its success. These managers play a large part in using what has been learned to improve performance. They can deliberately use their influence to further the transfer process.

Learning situation should resemble work environment

Learning situations that bear the closest possible similarity to the work environment have the following advantages:

- If the learning situations closely resemble the work environment, employees will soon realise that the skills taught will be useful in their work environment.
- The learning situations will address specific problems that arise when acquiring new skills and improving performance in the work environment.

A learning situation resembles the work environment if:

- the learning situation occurs in a work environment related to what needs to be learned
- the learning situation addresses the cognitive operations involved in conducting the tasks in the work environment
- the learning situation addresses problems arising in the work environment.

The trainer is familiar with the trainee's work

It is important for trainers to be thoroughly familiar with the work of the trainee that plays a key role in this curriculum.

- A trainer who is familiar with the trainee's work is able to select learning situations that apply to the problems the trainee encounters in the work environment.
- A trainer with this knowledge will naturally use terminology and examples that facilitate the trainee's understanding and application of new skills.
- A trainer with experience in the subject matter field has an easier time adjusting his comments to the content of the exercises.

Successful implementation of a programme starts right at the initial stage of its design

The development process of an educational provision is in itself an important learning process for the organization. Training needs assessment is a critical step in which executives, line managers, potential trainers and trainees should be involved. Their perceptions of the problem to be solved and the goals to be achieved should be as homogeneous as possible. Only then, will they and can they cooperate and direct their energy towards the same objectives. They will facilitate not only the implementation of the programme itself, but also the transfer of results into improved performance. To that end, project management is an adequate way to bring actors together and work on the programme development (Plomp, 1982, p. 41, 43).

The following sections provide instructions on how to design a curriculum that does the greatest possible justice to the principles listed above. There are three types of instructions:

a. Project management (Section 15.2)
b. 14 design steps (Section 15.3)
c. Cost-benefit analysis (Section 15.4)

Regarding a: Project management is intended to improve the feasibility of the newly designed curriculum. These instructions primarily apply to activities designed to ensure consensus among the various actors (such as top managers, developers, trainers, trainees' supervisors and trainees)

regarding problems to be solved, goals, and the appropriate operating procedure for implementation.

Regarding b: Programme design entails a systematic plan for an educational programme. These instructions ensure a high level of consistency among the various steps in programme design.

Regarding c: Cost-benefit analysis provides a useful tool for calculating costs of alternative programme designs. Estimation of benefits clarifies whether the proposed educational provisions are worthwhile for implementation. Cost analysis recurs during the development process. Is is not only part of the start up of a project, but is also reconsidered when choosing instructional strategies and planning evaluation. Cost-benefit analysis does not improve the effectiveness of a programme. It provides alternatives for refining efficiency.

15.2 Project management

The preceding analysis of the problem, its consequences for the work environment, and its transformation into specific, attainable skills require great care. Inaccurate analysis will result in educational programmes or courses that do not produce the desired effect. Furthermore, top managers and educators usually have little experience with this type of analysis. Top managers' formulation of an educational problem without establishing a training need frequently makes matters even more complicated. These individuals may easily take offence or consider the educator pedantic if he or she repeats the analysis of the assignment. Nor do top managers always believe the educator has any authority to conduct an interim step to assess the desired *Impact on the Work Environment.* Aspects related to analytical procedures and perceptions of the educator's authority make it necessary to reach clear agreements about operating procedures and organization of the curriculum from the very beginning of the design process. Viewing curriculum design as a project that needs to be prepared and conducted as such offers many advantages. Choose a project approach familiar to the organization to promote acceptance of the recommended operating procedure. It is possible to accommodate the individual design steps to fit the project approach chosen. The development process in Figure 15-3 serves as an example of this method. Figure 15-3 contains specific aspects of managing a project as well as design steps. These specific projects management aspects are explained below. The design steps are covered in Section 15.3.

The project manager and the top manager

The preliminary stage focuses on appointing a *project manager* and designating a *top manager in the role of principal.* The project manager is in charge of planning, carrying out, and proceeding with the project. Top managers issue the assignment, evaluate results, and provide manpower and resources necessary to carry out the project.

In addition to possessing the requisite educational skills, project managers need to be familiar with project management techniques. Developers usually serve as project managers as well. Complex projects with a delicate mix of educational aspects with other organizational interventions involving several developers may benefit from a project manager who is not one of the developers. The best candidates for this position are very experienced project managers receptive to this educational approach.

Stage	Activity
Preliminary Inquiry	Appoint a project manager Designate a top manager in the role of principal State the assignment Plan the project (including activities, capacity, schedule, and budget) Recruit the project team Discuss the operating procedure Assess the training need Determine the major goals of the curriculum
Design	Execute task analyses State instructional objectives State evaluation criteria Construct evaluation instruments Design learning situations - educational format - instructional strategies
Construction	Choose project team members such as trainers, coaches, and mentors Compile the course material Plan the execution Instruct trainers and other members of the project team Select trainees
Test & Revision	Run a pilot programme Evaluate the learning process Evaluate the learning results Adjust the learning situations
Implementation	Deliver the programme Evaluate changes in the work environment Assess the impact on the original problem Adjust the design Take procedural measures Conclude the project

Figure 15-3: Project management for curriculum design

Top managers should work at a level in the company hierarchy that is suitable for assessing the training need accurately and for focusing on both non-educational and educational aspects of the programme. These aspects include analysing the problem, formulating major goals, indicating the impact on the work environment, determining crucial skills for managers and employees, and ensuring favourable conditions in the workplace for transferring learning results into improved performance. It is essential that the top manager have a vested interest in the project's success. This interest will increase the investment of resources and give the project greater visibility in the organization. This visibility is essential for implementing the necessary changes in the work environment at a later date. Some organizations have permanent training commissions or steering committees to serve as client or principal for educational projects within a given task force or unit. This system is ideal, provided the committee consists of concerned managers in a position to carry out the responsibilities described above. If the group contains mostly of staff associates or specialists in certain fields with no managerial authority, this delegation will not be a good principal.

State the assignment

Stating the assignment is the first critical step in the design process. Statements such as "Design a course on...," or "Draw up an educational programme for...," or "Adapt the current training for..." may seem logical at the beginning of the development process. These statements, however, imply prior knowledge of the training needs. The essence of the design standards is to assess the training needs as carefully as possible. Project managers and top managers should be responsive to this need and should be prepared to modify or restate the original statement of purpose in the early stages of the design process. A statement of assignment that would make a major contribution towards achieving possible organizational goals might read as follows:
"Investigate whether learning processes might help solve ...,"
or:
"Investigate whether adaptation of the current educational programme for ... might help solve ..."

Many organizations still find it highly unusual to commission the design of educational programmes in this manner. Consequently, project managers will need to discuss the underlying views and principles of this approach in considerable detail to obtain general approval.

Planning the project

The plan of the project is a managerial document that serves to initiate, execute, and control various activities. It should include plans for activities, capacity, a schedule, and a budget. The items may be described in the same style as the organization's other project documents. The project approach described above, which is subdivided into Preliminary Inquiry, Design, Construction, Test & Revison, and Implementation, may serve as a basis. The description of the design steps repeatedly state that, despite the linear sequence of the steps, the design process is a cyclical procedure that both enables and requires repetition of steps. The project plan will have to provide for iterative leaps.

With complex projects it will be difficult to complete all the necessary plans and budgets at once. It is, however, possible to plan each stage separately within a global framework. The output of one stage can serve as - or may include - a finished project plan for the next.

Recruit the project team

Even though developers are responsible for a substantial portion of the design process, it is nevertheless useful to make use of a project team. This team can speed up various activities, expand the scope of the educational programme, increase involvement in the project, and provide access to valuable sources of information. It should include representatives of concerned parties such as the top manager, the project manager, managers of potential trainees, the developer(s), possible trainers, and members of the target group.

The managers of the potential trainees are particularly important members of the project team. These individuals are key figures for transforming learning results into performance improvements (Robinson & Robinson, 1989). Increasing the involvement of line managers in the design and implementation of the educational programme will considerably enhance the transfer of learning results to the work environment. Assigning influential roles in the project organization to trainees' line managers will satisfy the principle of involvement of line management.
Project teams officially report to top managers and are responsible for planning and execution as well as the output of their work. Despite the team's responsibility, developers nevertheless perform most of the actual tasks themselves.

Discussion of the operating procedure

It is essential for project managers to keep those involved informed of both the purpose of the project and the appropriate operating procedure. Organizations are frequently unfamiliar with this procedure for designing educational programmes. While the crucial consistency between the problem, the work environment, skills, and learning situations (see Figures 15-1 and 15-2) may appear perfectly logical in theory, the actual execution of a project may meet with great resistance. Especially activities such as treating problems as organizational issues rather than as educational matters, highlighting changes necessary in the work environment, emphasising skills over knowledge and insight, and designing learning situations that enable employees to master these skills are not immediately associated with planning and offering a course.

Project teams are essential to establish the necessary contacts and to make needs assessment possible. They try to resolve conflicting reports and issue the final approval for the instructional objectives that result from task analysis. Project teams also consult top managers to determine appropriate courses of action for reducing or eliminating transfer barriers in the work environment.

Project manager's instructive discussions on these activities serve to involve team members in a learning process of their own. Discussions regarding the selection of evaluation criteria (Step 5) are essential learning experiences for project team members and top managers. Once these descriptions and discussions are common knowledge, they will enhance the learning ability of the organization. Skipping or reviewing superficially the complicated stage in the design process in which evaluation criteria are established will leave many problems unsolved and questions unanswered. Trainees will suffer the consequences of this negligence.

Familiarity with this operating procedure, recognition of the close relationship between organizational goals, organization of the work environment, favourable and unfavourable working conditions, and consideration of coaching skills are crucial to the curriculum's success, especially regarding integration of learning results in the work environment. Project team members contribute substantially to this process involving project design, execution, and implementation, particularly once they have mastered both the conceptual framework and the practical applications. To this end, project managers should review the necessary

points of information at each stage of the project. Project teams should learn each activity related to this conceptual framework. Curtailing this intrinsic learning process of the project team will inhibit the organizational learning ability and will impede implementation of the finished educational design.

Favourable conditions for implementation include:
- Cooperation with potential trainers during the design stage to develop the test of competency and during the construction stage to develop course materials. The test of competency is the practical equivalent of the instructional objectives. Trainers will use course materials more than any other aids. Increasing their involvement in developing these items will substantially enhance the role of the materials in the programme and the feeling that they will be valuable training aids.
- Use of trainees' line managers as trainers and coaches during the implementation stage. This recommendation is based on the paradigm that inextricably links education and management.
- Involvement of trainees' line managers in administering the test of competency. This test will reveal both intended and existing skills. If the work environment fails to encourage, foster, or reward these skills, they will soon disappear. Assistance from line managers in administering the test of competency will actively encourage application of the new skills in the work environment.

Project Conclusion

Concluding the project is one of the project team's final tasks. The team ends the project with an analysis of the results of the evaluation and subsequently implements necessary changes in the educational design. Project team members also try to remove barriers to the transfer of the learning results to the work environment.

The conclusion should provide an official answer to the following questions:
1. Has the problem that led to the training need been solved?
2. If the problem remains unresolved, is this condition due to a lack of skills or to barriers in the work environment?

The answers will indicate the results of these educational efforts. If the problem persists despite mastery of the desired skills, failure is not due to flaws in the educational design. The view that educational efforts are

useful only in conjunction with an approach that integrates learning processes with an evaluation of favourable and unfavourable conditions within the organization is the underlying principle of this project strategy.

Further useful reading:

Robinson & Robinson (1989, pp. 69-82) emphasise the importance of the initial project meetings and of the social contract between developer and client-manager. Throughout these initial meetings, it is imperative that the developer set an example by demonstrating collaborative behaviour:

> 'This is a give-and-get style of consulting, and so it means continually eliciting from clients what they mean, as well as indicating what you need (such as time, people, money, and information) if you are to meet those desires' (p. 71).

The specific relationship between client and human resource professional is elaborated by Jackson & Addison (1992).
On establishing a contract between consultant and client, see Block (1981).

Rothwell & Kazanas (1992, pp. 264-276 and pp. 292-311) stress the importance of the project manager's interpersonal skills:
- skills '... in facilitiating group dynamics and teambuilding, helping members of the group proceed quickly through the forming and storming stages in which all groups progress'
- skills '... in negotiating with people and influencing them'.
They provide instructions on preparing a timeline, budgeting, monitoring the time of team members, tracking project accomplishments, establishing methods to reallocate funds, and planning and monitoring equipment and facility requirements.

Romiszowski (1981) draws outlines of the project's working documents (p. 160) and presents an overview of sources why projects fail (pp.380-397).

Further readings on project management for developing educational programmes include: Hennessy & Hennessy (1989), Pieters & Mulder (1992), and Wolde (1992).
Generic information on project management appears in: Frame (1987), Evers (1990), Jackson & Addison (1990), and Wijnen, Renes & Storm (1988).

15.3 14 Design Steps

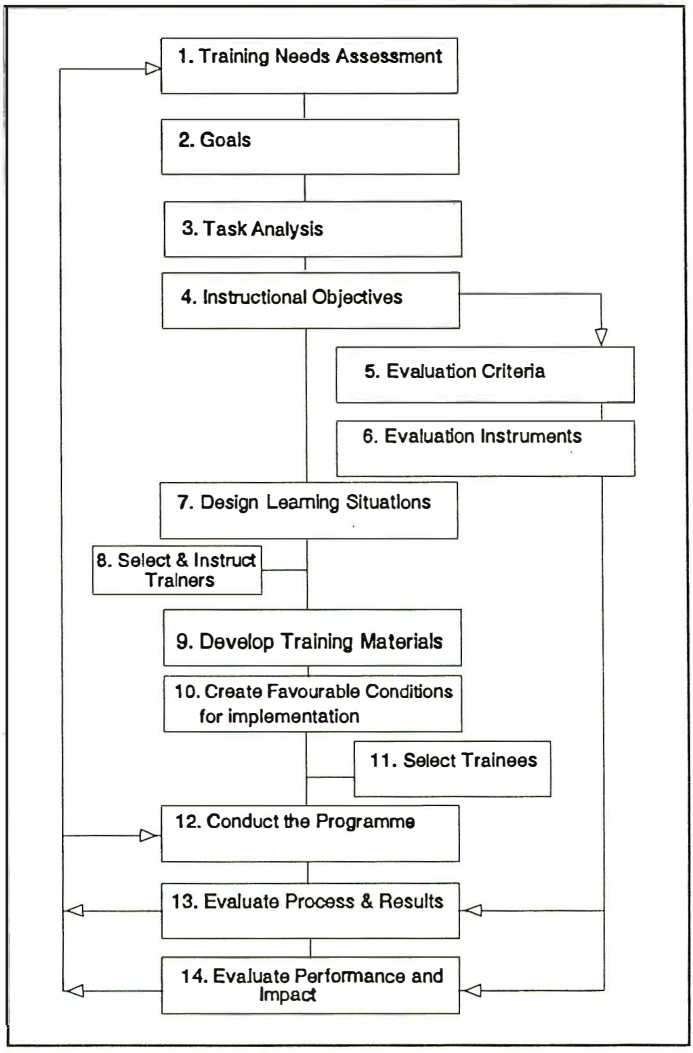


Figure 15-4: 14 Design Steps

Although the programme design suggests a linear sequence (Figure 15-4), the various steps may require repetition or elaboration of previous activities. Each step involves new decisions and verdicts that call for additional information. The phrasing, however, becomes more specific and uses an approach that was either unclear or unavailable in previous steps. Thus, the design process, which appeared linear, becomes a cycle.

Step 1: Training Needs Assessment

Step 1	Training Needs Assessment
Goal	Determine whether learning processes may (partially) solve the problem.
Operating Procedure	1. Describe the problem. 2. Which changes are necessary in the work environment? 3. Which skills do the employees need for this purpose?
Output	A report with an analysis of the problem and possible solutions
Remarks	This step should contain what is necessary to set the main goals and to describe supporting activities in the work environment.

Explanation:

Goal: Determine whether learning processes may (partially) solve the problem.

Operating Procedure:

State the problem
Try to formulate the problem at hand. Do strategic goals cause problems on the operational levels in the organization? Are these problems due to a lack of skills or to other causes in the work environment?

Frequently, requests for educational programmes fail to describe *any* problem at all. These requests do, however, mention the desirability of an educational programme. The educational goal is usually phrased along the following lines: employees should acquire a greater understanding of..., learn more about..., broaden their horizons in the area of..., take a refresher course in..., see eye to eye on..., receive good instruction on..., learn the lay of the land on..., be shown the ropes about... The goal is likely to stipulate the knowledge and understanding desired or the preferred learning situations. If a problem is stated in this way, it tends

to involve inadequate knowledge or understanding or skills, rather than the necessity of a solution to a problem within the organization or the achievement of a certain effect in the work environment.

Consequences for the work environment

Describe the changes in the work environment that are necessary to solve the problem described above. Alternatively, indicate which operating procedures are needed to achieve the goal. Examination of the changes necessary in the work environment will reveal considerably more approaches to the problem than merely educating certain groups of employees. The consequences for the work environment may range from changes in the operating procedures (both departmental and interdepartmental), through task distribution, assignment of responsibility and authority, use of tools and aids, distribution of rewards and penalties, selection, performance feedback, job enrichment and enlargement to the provision of reference manuals (Romiszowski, 1981).

Inadequate skills

Once the necessary changes in the work environment are established, it is important to investigate whether the implementation of these changes requires skills the employees currently do not possess. These employees may work either in or outside the departments in question. They may also work at managerial or operational levels, as long as they play a role in achieving the desired changes. If it is not possible to list specific skills, it is questionable whether education (learning processes) will contribute to the changes desired in the work environment.

It is important to list skills rather than knowledge or understanding. Knowledge and understanding alone will not suffice to implement changes unless they lead to new skills. Employees need to perform differently. If failure to achieve the desired performance results from managerial shortcomings or inadequate organization of work rather than inadequate skills, possible solutions should emphasise changes in managerial or operating procedures. Should the managerial shortcomings stem from inadequate leadership skills, then the educational programme should address these skills. If changes in operating procedures are possible only through mastering new skills, these skills form a basis for designing curricula.

This first step in programme design is based on ascribing a specific problem within the organization to the marked absence of specific skills. If this step is not feasible or useful (for example if the present employees are unable to master the skills desired), there is no reason to continue designing an educational programme.

Further useful reading:

A fundamental and multi-disciplinary approach to the definition of the problem and its analysis is provided by Romiszowski (1981, Parts 1 and 2). On the basis of performance technology as advocated by Gilbert (1978), Harless (1970, 1979), and Mager & Pipe (1984), a schema for front-end analysis is presented including training and non-training components. Romiszowski (1981, p. 110) highlights some typical 'solution-seeking-a-problem' practices, including:
- the training department's catalogue of courses. It often results in ill-matched training solutions and increases unnecessarily the number of trainees, 'because the programme is there'.
- the questionnaire requesting a specification (in both quantity and type) of the training need of a department or section. It has the same shortcoming as the training catalogue and encourages a parochial attitude by departments with little concern for the relevance of the training needs to other sub-systems.
- job performance evaluations may avoid problems of the type mentioned above if done by specialised training staff. However, a mass of data accumulates that is difficult to sort out with no basis for assigning priorities.

Harrison (1992) covers the problem of identifying training and development needs in detail by using the appraisal system (pp. 303-325), and focuses on the wider employee resourcing and development strategies and policies of an organization. Furthermore, she uses three kinds of analytic approaches for needs assessment (pp. 244-260):
- the *comprehensive approach*, which is a thorough analysis of all the organization's training and development needs,
- the *problem-centred approach,* which addresses urgent problems that require an immediate training or development response,
- the *business strategy approach*, which involves needs assessment at board level, part of the overall employee resourcing plan, and is driven by business strategy, operational priorities, and key changes in the environment or technical base.

Similar approaches are described by Van Wart, Cayer & Cook (1992, pp. 69-95), although they do not distinguish clearly between needs assessment and task analysis.

Robinson & Robinson (1989, pp. 83-160) distinguish between performance effectiveness assessment and cause analysis. They structure the decision-making process in the needs assessment phase by posing the following questions:
1. What is the nature of the specific performance or behaviour required?
2. How does learner performance compare to ideal performance?
3. Why is job performance below the level desired?
4. How receptive is the work environment to new skills?

Van Noort (1992) developed an algorithmic flow chart that deduces training needs from a perceived organizational problem.

Practical information on planning and conducting needs assessment is provided by Tracey, (1984, pp. 54-84), Roscoe (1992) and by Rothwell and Kazanas (1992, pp. 43-66).

Discussions on the theoretical underpinnings of training needs assessment may be found in Kaufman (1982, 1990), Kaufman, Stakenas, Wager & Mayer, (1981), Kaufman & Thiagarajan (1987), Stolovitch & Keeps (1992), Pieters (1991) and Rossett (1987, 1992).

Sometimes the assessment of relevant characteristics of learners and of a work environment are perceived as two different types of analysis that should follow needs assessment (Foshay, Silber & Westgaard, 1986; Rothwell and Kazanas, 1992, pp. 67-95). In Step 1, the three types of assessment are discussed in connection to each other.

Newstrom & Lilyquist (1990) and Zemke & Kramlinger (1982) presented overviews of specific needs assessment techniques.

Boekenoogen & Stokking (1991) conducted research on the nature of emerging problems related to needs assessment.

Additional readings on this topic include:
Benjamin (1989), Peterson (1992), Kessels & Smit (1989a, pp. 42-56), Rae (1992), and Lamers & Thijssen (1991).

Step 2: Goals

Step 2	Goals
Goal	Determine the goals of the curriculum.
Operating Procedure	Restate the contents of the report on training needs assessment in terms of project goals.
Output	A description of: a. the target group(s) b. select main skills c. supporting activities in the work environment
Remarks	The goals are an elaboration of the previous step and delineate the area that will undergo task analysis (Step 3).

Explanation:

Goal: Determine the main goals of the educational project.

Operating Procedure:

Training needs analysis provides a basis for formulating the goals of the curriculum. These goals consist of the main skills the employees must master as well as the supporting activities needed to apply these new skills in the work environment. These supporting activities serve to create a stimulus and to remove or reduce barriers to the application of the desired skills in the work environment.

Remarks:
As with needs assessment and task analysis, few authors distinguish between goals and instructional objectives. However, this distinction has a practical reason. Task analysis is a very time-consuming and costly affair. Therefore, it is important to have a clear view of the problem that has to be solved and to know whether it is a problem to be solved by training or by interventions of another type before starting task analysis. To that end, needs assessment is conducted. The results of needs assessment (for the training part) are stated in terms of goals. The results of task analysis are stated in terms of instructional objectives.

Further useful reading:

Mager (1972) provides practical instructions for stating and analysing training goals.

Rothwell & Kazanas (1992, pp. 123-128) describe five steps in goal analysis:

1. Identify the goal and write it down. Clarify what instruction intends to achieve.
2. Identify types of behaviours conducive to the goal.
3. Sort out unrelated items and eliminate redundancies.
4. How should learners demonstrate goal achievement?
5. Test the performance objectives to ensure they are linked to the goal and, when enacted, will lead to the desired results.

(Additional task analysis is usually required for Steps 2 and 4.)

Step 3: Job and Task Analysis

Step 3	Job and Task Analysis
Goal	Gather information to: a. specify the main objectives b. determine the evaluation criteria c. locate barriers and stimuli
Operating Procedure	Various methods of analysis
Output	A report that describes goals, evaluation criteria, barriers and stimuli.
Remarks	The task analysis consists of the information necessary to formulate instructional objectives (Step 4). Additional task analysis may prove necessary during subsequent stages.

Explanation:

Goal:
Analyse the present and desired work environments:

a. to state the goals in terms of cognitive, interactive, reactive and psycho-motor skills (for a classification of skills, see Romiszowski, 1981);
b. to establish evaluation criteria;
c. to trace barriers and stimuli to the acquisition and application of new skills.

Operating Procedure:

Task analysis serves to gather all the information about the instructional objectives of the educational programme and aspects related to the achievement of these goals. There are various ways of performing this activity, such as textual source analysis, interviews, observations, critical incident techniques, focus groups, analysis through performance, adoptions, comparisons, motion studies and juries of experts. For a description, see Kessels and Smit (1989). Because of its time-consuming nature, task analysis is a costly step in the development process. If time pressure

makes it necessary to keep task analysis to a minimum, the following principles apply:

a. Try to gather information from at least three levels in the organization: the target group, the managers of the target group and the target group's subordinates. Include key-actors in the data collection.

b. Try to use at least three different methods of gathering information (the use of three different information-gathering techniques is also called triangulation and serves to increase the reliability of data, particularly in the case of qualitative analysis). Examples include sources analysis, interviews and critical incidents.

Efforts to obtain statistically reliable data are of little use. Each new approach to the problem within the organization adds so much to the original design of an educational programme that quantitative methods of analysis often unnecessarily complicate the design of corporate education. Furthermore, (customised) educational programmes tend to address small target groups, thus making it difficult to apply statistical methods. If the programme addresses a large group or (small) decentralized groups, try to randomize selection and strive for representative sites. Involve key-actors when designing procedures for data collection. They are well-informed on relevant and accessible sources of information.

Task analysis provides information for instructional objectives and evaluation criteria. This step will also generate several ideas for activities such as planning learning situations, designing assignments and drawing up learning situations. Although learning situations are planned later in the design process (Step 7), task analysis helps provide new ideas for planning the curriculum. Record these ideas and do not hesitate to reiterate steps.

The task analysis report includes the following items:

a. An itemisation of the main goals and supplemental skills, classified according to the four domains described above. This itemization will facilitate judicious selection of possible learning strategies in Step 7.

b. Barriers and stimuli to mastering these skills. Determine what is difficult and what is easy. This information will provide a focus for designing the learning situations.

c. Barriers and stimuli to applying these skills in the work environment. The stimuli may be of use in applying what has been learned in the work environment. It is important to take the

necessary measures to avoid barriers against the transfer of the new skills (Robinson & Robinson, 1989).

Further useful reading:

Many publications review techniques and procedures for task analysis. Patrick (1991, pp. 127-166; 1992, pp. 131-270) distinguishes between task-oriented approaches and person-oriented/psychological approaches. He defines the differences as follows:

> 'Task-oriented descriptions concern the goal of performance, the equipment of conditions in the work situation or the observable activities associated with a task. Person-oriented descriptors relate to the cognitive capacities used or required by the person performing the job.'

Swanson & Gradous (1986) categorize four kinds of tasks each requiring a different analytical approach: procedural tasks, process tasks, troubleshooting tasks and mental tasks.

Planning and conducting the task analysis stage is described by Annett, Duncan Stammers & Gray (1971), Tracey (1984, pp. 85-139), Rothwell & Kazanas (1992, pp. 96-119), Dennis & Austin (1992), Rae (1992) and Kessels & Smit (1989b, pp. 142-176).

A great variety of job and task analysis techniques is described in detail by Zemke & Kramlinger (1982), Carlisle (1986), Pieters (1992b), Gäel (1988), McCormick (1979), Kirwan & Ainsworth (1992), Merrill (1987), Mills, Pace & Peterson (1988) and Craig (1992).

Flanagan's critical incidents technique (Flanagan, 1954) is a very powerful group activity to obtain performance statements on intangible behaviours. It is not only an effective procedure for data collection, but also a meaningful learning experience for the participants.

In general, instructional designers love job and task analysis once they have experienced it. It brings them out of their cubicle and into the real action of the organisation. However, many designers get bogged down in piles of data and end up stating hundreds of instructional objectives that will never be pursued. Managers feel uneasy about this kind of time-consuming and costly activity, which they believe has little to offer. Swanson & Gradous (1986, p. 239) warn against this paralysis through analysis. Hiebert & Smallwood (1990) consider this problem a reason for

recommending a completely different approach to needs analysis. As opposed to the objectivist tradition, they introduce an interpretative approach. Unlike the objectivist tradition, the interpretative approach does not assume that an objective set of training needs exists. Developers and clients choose their approach on the basis of their experience, knowledge, skills and preferences. The environment consists of a dynamic flow of information. Since the analyst is part of that environment there is no such thing as an objective observer. Meanings, interpretations, and therefore also training needs, are socially and culturally determined. They may be negotiated and renegotiated. Needs and job analysis is thus a process of negotiations and agreements in which the analyst is a major stakeholder. This too, stresses the importance of including key-actors in the phases of needs assessment and task analysis. Hiebert & Smallwood (1990) introduce the integrative approach as a compromise between the objectivist and interpretative modes. It combines both modes. The goal of the integrative approach is to use objectivist language and processes while thinking in the interpretative mode and stimulating participants to recognize the value of new approaches.

Step 4: Instructional Objectives

Step 4	Instructional Objectives
Goal	List the main goals in terms of instructional objectives.
Operating Procedure	Process the information from the task analysis in Step 3. List the skills involved.
Output	Select target skills in the following areas: a. cognitive b. interactive c. reactive d. psychomotor
Remarks	A maximum of 15 realistic instructional objectives (per instruction unit). The instructional objectives should reflect the added value of task analysis.

Explanation:

Goal:
Determine the curriculum's instructional objectives. Rephrase the goals in terms of cognitive, interactive, reactive and psychomotor skills.
The instructional objectives are the principles for determining the evaluation criteria and instruments.
The instructional objectives form a basis for learning situations designed to help trainees acquire the skills in question.

Operating Procedure:

Task analysis provides the information for determining the instructional objectives. The task analysis reports contain a preliminary version of these instructional objectives. Because these objectives in corporate educational programmes are stated in terms of skills, their formulation should include a verb that specifically refers to a skill essential to performing tasks in the work environment.

Example:
- Trainees can solve problems involving ... (cognitive);

- Trainees can use ... data to set weekly, monthly and annual agendas (cognitive);
- Trainees can correct and instruct employees on how to improve customer service (interactive);
- Trainees can clearly distinguish between corporate and personal interests in taxing situations (reactive);
- Trainees can use 'peeqyeware' parts to assemble objects according to 'arestee' specifications (psychomotor).

Classifying instructional objectives according to the four skill domains will be conducive to the selection of instructional strategies in a later stage of the design process.

Remarks:
It is of little use to generate large numbers of meticulously defined instructional objectives, as it becomes difficult to combine more than fifteen in one careful programme design. This problem applies in particular to rather short curricula lasting two to five days.

The instructional objectives should be realistic. If the curriculum merely serves as an introduction to a certain skill, it would not be justified for the instructional objective to imply that the trainee will have thoroughly mastered this new skill by the end of the instructional activity.

The instructional objective should reflect the added value of task analysis. If developers could have formulated the objectives without this analysis, it becomes questionable whether the extensive examination of the trainee's work environment has been of any use at all.

Further useful reading:

A lot of research has been done on the phenomenon of instructional objectives. DeLandsheere (1991) presents a review of taxonomies that includes five for the cognitive, one for the affective, and six for the psychomotor domain. No taxonomy of interactive skills is available.

Romiszoswki (1984) presented a new schema of skills that included interactive skills and distinguished between skills of productive and reproductive nature. The schema of skills is an important tool for selecting instructional strategies.

Carnevale, Gainer & Meltzer (1991) published the findings of a research project on the implications for training in the sixteen fields of competence that employers consider basic workplace skills. These categories of skills include:

- learning to learn, which is perceived as the foundation for all other skills
- reading, writing and computation, the basic skills for technical competence
- communication skills (oral communication and listening)
- adaptability skills (problem solving and creative thinking)
- developmental skills (self-esteem, motivation, goal setting, employability and career development)
- group effectiveness skills (interpersonal skills, team work, and negotiation techniques).
- influencing skills (organizational effectiveness and leadership ability).

Many authors, including MacDonald-Ross (1973), have criticized the behavioural outcome approach inherent in instructional objectives.

Harless' (1970) statement: 'one ounce of analysis is worth a pound of objectives' expresses the excessive emphasis on instructional objectives.

Goodlad (1960) referred to the fact that untill 1960, there appeared to be no studies establishing an actual relationship between increased clarification of educational objectives and improved discrimination in the selection of classroom learning opportunities for students.

However, Hartley & Davies (1976), who summarise 40 studies, conclude that it is beneficial to provide trainees with objectives before training them.

In 1969, Eisner introduced the concept of expressive objectives to denote the outcome of a planned encounter or learning activity to provide students with an opportunity to personalise learning (Eisner, 1985).

In *The Instructional Quality Profile* (Merrill *et al.*, 1979), instructional objectives dominate the procedures for assessment of programme consistency.

Procedures for deriving objectives from needs and task analysis are described by Romiszowski (1984, pp. 36-53) and Kessels & Smit (1989a,

pp. 69-90). Detailed instructions for stating instructional objectives are provided by Mager (1962), Davies (1971) and Meyer (1978).

Step 5: Evaluation Criteria

Step 5	Evaluation Criteria
Goal	Determine the criteria for evaluating whether the curriculum has reached its goals.
Operating Procedure	Search for indicators pertaining to the various levels of assessment: a. learning process b. learning results (in terms of skills) c. performance d. impact Determine these indicators in agreement with the top manager.
Output	Sets of evaluation criteria for: a. learning situations b. skills mastered c. performance in the work environment d. impact on the initial problem
Remarks	This step may require further task analysis. Determining the evaluation criteria can be a valuable learning experience for those involved in the design process.

Explanation:

Goal:
This step determines the criteria for evaluating whether the curriculum to be designed has reached its goals. The taxonomy applied here generates four levels for assessing the evaluation criteria:

a. Process: Does the design include learning situations suitable for mastering the desired skills?
b. Learning results: Have trainees acquired the expertise necessary in the desired skills?
c. Performance: Have trainees applied their new skills in the work environment?
d. Impact: Does the work environment reflect the desired changes, and have these changes helped solve the original problem within the organization?

See Figure 15-2 for the different levels of evaluation (Kirkpatrick 1975, Schramade 1989).

Operating Procedure:

To determine appropriate evaluation criteria, developers should search for indicators for each level of assessment (process, result, performance and impact). The project team and the top manager can assign values to the indicators to serve as a basis for evaluating each individual level.

Regarding level a. Learning Process:
The process level stresses providing trainees with ample opportunity to become thoroughly familiar with the new skill and making sufficient information about this skill available. Furthermore, the feedback should enable trainees to improve their mastery of the skill, the work environment should be a safe testing ground for new techniques, and so on.

Regarding level b. Learning Results:
The learning results level entails gathering indicators for the top manager to assess whether trainees have properly mastered the desired skills. Top managers and developers must understand these skills clearly to determine these indicators, whether or not the skills are being applied correctly and how to recognise correct or incorrect application of the skills.
The developer will have gathered this information through task analysis. The top manager and the project team will have given their stamp of approval following the task analysis report.

It is necessary to set the criteria for the instructional objectives described above to determine the desired skill:

- Trainees can solve problems involving ... (cognitive).
  What constitutes a solution to the problem? How should trainees reach a solution? How is it possible to tell whether the correct problem-solving strategy has been applied?

- Trainees can use ... data to set weekly, monthly and annual agendas (cognitive).
  What constitutes a correct weekly, monthly or annual agenda? Which factors come into consideration during this operation? How is it possible to tell whether the desired operating procedure has been used?

- Trainees can correct and instruct employees on how to improve customer service (interactive).
  Which methods of correction and instruction will improve customer service? What focus is suitable for correcting and instructing? How is it possible to determine whether the skill has been applied correctly?

- Trainees can clearly distinguish corporate from personal interests in taxing situations (reactive).
  Which circumstances are considered taxing situations that require careful consideration of the various interests at stake? How does careful consideration of interests become evident?

- Trainees can use 'peeqyeware' parts to assemble an object according to 'arestee' specifications (psychomotor).
  Is it easy to determine whether a project meets the specifications? How may 'peeqyeware' parts be used correctly?

Regarding level c. Performance:
The performance criteria serve to determine whether trainees are applying the new skills in the work environment. Performance evaluation means finding a way to determine whether a trainee solves a particular problem appropriately, corrects and instructs others on customer service, carefully weighs the interests at stake and works on specific projects. The distinction between criteria for the learning result level and the performance level may not always be clear in practice. It is important to stress the following:

- The learning result level shows whether trainees have mastered the desired skill. This set of criteria determines whether they are *capable* of performing the operation.
- The performance level shows whether trainees are applying the desired skill in their work environments. This set of criteria determines whether they *apply* the skill.

This distinction is important because the learning results criteria indicate whether trainees have learned anything. The performance criteria help establish whether there are barriers preventing the trainees from applying what they have learned. The description of task analysis (Step 3) already mentioned the importance of gathering information both about the desired performance and about favourable and unfavourable conditions for this performance. These barriers and stimuli are very important in distinguishing between learning results and performance. In fact, these factors are decisive for the transfer of skills from the learning situation to the

work environment. The trainees' managers are crucial in applying these skills in the work environment (Robinson & Robinson, 1989). It is therefore vital that these managers become involved in discussing useful evaluation criteria for performance during this stage of the programme design. Both in the project team and outside, managers' input will provide a powerful incentive to removing unfavourable and reinforcing favourable conditions for the transfer of the skills.

Level d. Impact:
The impact criteria help determine whether the problem that originally gave rise to this curriculum has been solved. These criteria serve as a barometer of whether the desired changes have been effected in the work environment and whether these changes have solved the problem (i.e. achieved the main goal as stated in Step 2). These indicators should appear in the training needs assessment report (Step 1). The project team's discussion of evaluation criteria for the impact level will undoubtedly reopen the discussions about the original problem and the training need.

Remarks:
To determine the evaluation criteria, developers will probably need to perform additional task analyses to generate useful criteria. This requirement does not pose a problem, as the phrasing of the question continually becomes more precise and contains information that was unavailable in previous stages. This repetition gives the design process a cyclical nature that benefits the final result.

We found scarcely any evaluation criteria in the educational programmes we examined. The few we did find tended to be implicit in the evaluation of test assignments (learning result level). We found no evaluation criteria for process, performance or impact. The absence of evaluation criteria does not automatically doom a curriculum, although it does make it difficult to determine whether the educational programme has achieved its goals and whether it has been of any use. Without formulating criteria, the organization has no opportunity to reflect on the possibilities and limitations of learning processes and educational programmes. Consequently, education remains an underdeveloped tool for management. Careful determination of evaluation criteria at regular intervals sheds continually more light on possible solutions to a specific problem, whether or not these solutions involve education.

Further useful reading:

Most of the literature on evaluation and evaluation criteria is based on theoretical underpinnings developed by:

- Kirkpatrick (1967/1975): four types of evaluation levels, including reactions, learning, job behaviour, and results;

- Scriven (1967): formative and summative evaluation;

- Stufflebeam (1971, 1973): evaluation procedures for making planning decisions, recycling decisions, structuring decisions, and implementation decisions;

- Stake (1973): evaluation of congruence between intentions and outcomes, of logic contingencies among programme elements and of empirical contingencies among observed elements;

- Hamblin (1974): five levels of training effects, consisting of reactions, learning, job behaviour, organization, and ultimate value.

The relationship between goals, objectives and evaluation criteria is discussed in detail by Sanderson (1992, 114-142), Tracey (1984, pp. 140-176), Rothwell & Kazanas (1992, pp. 114-156), Romiszowski (1981, pp. 360-365), Brinkerhoff (1988, pp. 9-38), and Robinson & Robinson (1989, pp. 163-279).

Baker & O'Neil (1987), Patrick (1992, pp. 513-541), Schramade (1989), and Spitholt (1989) have published detailed reviews of evaluation literature dealing with corporate education.

Step 6: Evaluation Instruments

Step 6	Evaluation Instruments
Goal	Design information-gathering techniques. Apply the criteria from Step 5 to this information.
Operating Procedure	Design instruments suited to each stage of the evaluation process: Each instrument provides reliable data to be tested against existing criteria.
Output	Four sets of evaluation instruments: a. learning process b. learning results c. performance d. impact
Remarks	A close link should exist between the goals and the evaluation instruments. The integrity of the design process requires that the evaluation instruments be designed *before* the learning situations, content, and training materials.

Explanation:

Goal:
Design information-gathering techniques. Apply the evaluation criteria to this information to determine whether a specific goal has been achieved.

Operating Procedure:

Design four types of evaluation instruments based on the four levels of assessment described in *Step 5: Evaluation Criteria.*

a. Learning process:
Gather information on the learning situations and the learning process to determine whether the learning situations that have

been designed are suitable ways to master the desired skills. Questionnaires and observation can provide information on areas such as opportunities for practising, possibilities for feedback and the learning environment.

b. Learning Results:
Trainees should have the opportunity to prove they have mastered the desired skills. Especially in the case of instructional objectives described as skills, evaluation instruments should involve testing the trainees' proficiency. Request that they demonstrate the new skill. Merely talking or writing *about* the skill is insufficient proof of one's familiarity with it.

c. Performance:
Gather information about the trainees' performance in the work environment to determine whether they are applying their new skills. Methods such as questionnaires, interviews, observations, source analysis, product demonstrations, quality control research, mystery guests and customer surveys may indicate the extent of the transfer of skills to the work environment and the barriers that exist.

d. Impact:
Gather information about the work environment and its overall effect on the organization to determine whether the desired changes have taken place and whether they have helped solve the organization's original problem. Several of the methods described above may be applied. Procedures for investigating impact will closely resemble those of initial training needs assessment. The information-gathering methods are closely linked to the nature of the problem at hand.

Apply the criteria in Step 5 to the information gathered by the developer according to the method described above. The developer, project team and top manager can use the results to take the necessary steps toward improvement. These measures may address the learning situation, trainees, trainers, work environment, colleagues and managers at the workplace or the organization itself.

Remarks:
Determining the evaluation criteria and designing evaluation instruments

would appear to *precede* the design of learning situations. In practice, however, evaluation criteria are rarely determined at all, while evaluation instruments are frequently designed at the end of a programme's execution and usually evaluate only the process itself. Occasionally, an evaluation of learning results also takes place. Our investigation of educational programmes revealed no systematic evaluation of changes in performance or of the impact on the original problem.

We treat the determination of evaluation criteria and the design of evaluation instruments as another step towards setting goals. Evaluation criteria and instruments provide a more detailed definition of the objectives. They are probably of more use to the trainers, managers and trainees as statements of purpose than are instructional objectives.

By devoting more time to the levels of assessment during the design process, we hope to achieve the following:

a. A curriculum's possibilities and limitations within an organization are clear from the outset.
b. The steps necessary to implement changes in the work environment are clear from the outset. Educational programmes may be secondary in importance to these actions.
c. Once the evaluation criteria have indicated the ideal result of a curriculum as well as the best method of establishing this result, it will be much simpler to design learning situations conducive to achieving the desired results.
d. Designing evaluation instruments *after the fact* entails the risk of their focusing on the curriculum's training materials rather than on the original target skills.

Further useful reading:

In addition to the references in the section on evaluation criteria (Step 5), the following sources provide many techniques and instruments for assessing training results.
Goldstein & Buxton (1982), Tracey (1984, pp. 177-200), Morris, Fitz-Gibbon & Lindheim (1987), Van Wart, Cayer & Cook (1993, pp. 124-131), Brinkerhoff (1988), Romiszowski (1984, pp. 215-256), Harrison (1992, pp. 372-391), Cras (1992), Keursten (1992), Shelton & Alliger (1993), Rae (1986) and Tillema (1993).
A research guide for evaluating training programmes is published by Hawthorne (1987).

Step 7: Design Learning Situations

Step 7	Design Learning Situations
Goal	Design a blueprint for the entire curriculum. Formulate learning situations for each instructional objective that enable trainees to achieve the goal.
Operating Procedure	Analyse prerequisites such as the number of participants, available time and resources and start and finish dates. Make a blueprint of the educational programme: - on-the-job instruction - classroom training - method for individual study, computer assisted instruction (CAI) Select appropriate instructional strategies and operating methods for each instructional objective. Arrange the learning situations in a well-composed schedule.
Output	A curriculum consisting of: - a programme for the curriculum - a description of the learning situations - instructions to trainers, coaches and managers
Remarks	The learning situations should resemble the work environment and fit the instructional objectives.

Explanation:

Goal:
Design a blueprint for the entire curriculum. Formulate learning situations for each instructional objective that enable trainees to achieve the goal.

Operating Procedure:

A variety of factors determine the design of the curriculum:

a. The organization's own prerequisites, such as the number of participants, available time and resources and fixed start and finish dates. Other factors of this nature may include the impossibility of conducting educational programmes during vacation periods due to a shortage of manpower.

b. The nature of the instructional objectives may result in factors such as the learning process towards a cognitive, interactive, reactive, or psycho-motor goal.

c. Decisive factors also include the characteristics of the target group, such as motivation, age, ability, intelligence, educational background and experience.

Carefully weighed decisions in these matters require application of learning theory and instructional theory. The developer has to select from strategies for remembering, strategies for problem solving, motivational strategies, and strategies for skill application (see Gagné, 1973; Gagné & Glaser, 1987; Reigeluth & Curtis, 1987). Some of these strategies have to be adapted for adult learners (Knowles, 1990). Application of these strategies requires the design of instructional events that fit these strategies. Generic frameworks are described by Gagné (1973) and Plomp (1986):

Gagné (1973, pp. 302-319) structures the operation of instructional events as follows:

1. Gaining and controlling attention
2. Informing the trainee of expected outcomes
3. Stimulating recall of relevant prerequisite capabilities
4. Presenting the stimuli inherent to the learning task
5. Offering guidance for learning
6. Providing feedback
7. Appraising performance
8. Making provisions for transferability
9. Ensuring retention

In Plomp's morphological schema (Plomp, 1986) the instruction procedures are structured as follows:

Orientation
1. Presentation of content
2. Active operation with the content

Practice
3. Providing opportunity for practice
4. Providing feedback

Test
5. Intermediate diagnistic testing
6. Final testing

Feedback
7. Remove the cause of failing results

The factors listed above make it necessary to start with a blueprint of the educational programme comprising:
- on-the-job instruction
- classroom training
- method for individual study, computer assisted instruction

With this blueprint in mind, select appropriate instructional strategies and operating methods that take the factors described above into account.
In practice, the developer's experience and affiliations also play a large part in this selection:
- Were previous attempts to apply alternative instructional strategies successful?
- What are the developer's expectations of the various instructional strategies and operating methods?
- Is it possible for the programme to take the characteristics of the trainees into account?

Many different options are available for choosing instructional method designs, such as presentation, discovery, problem-based methods, simulations, logical, psychological and concentric designs. Other classifications involve a progression from easy steps to difficult ones or apply the law of diminishing returns by starting with those skills that maximise both the amount of time trainees can devote to work and what they can learn in the workplace.

The developer's outlook on learning processes or his or her affiliation with a specific school of educational psychology influences the choice of

classification (see e.g. Joyce & Weil, 1980; Reigeluth, 1983, 1987; Reigeluth & Curtis, 1987).

The following considerations are crucial:

- How do I view the learning process necessary for a trainee to achieve the instructional objective?
- Which learning situations influence and stimulate the learning process?
- How should I design these learning situations?

Strategies for answering these questions include: differentiation between reproductive and productive goals, the learning cycle, and the use of matrices.

Reproductive and Productive Goals

Important instructions for designing learning situations appear in Romiszowski's work (1981 and 1984). Especially the distinction between reproductive and productive goals leads to significantly different instructional designs.

Reproductive goals entail skills of which the application tends to follow a set procedure. The operating instructions consist of items such as the operating procedure and the rules in question.

Example: Operating Procedure HG-22 enables trainees to use the appropriate tools to change the main generator's graphite brushes.
The learning situation must present procedural rules and provide opportunities for practice. Only one approach or a limited number of previously described approaches should be possible.

Productive goals entail skills applicable to new problem situations without a predefined operating procedure. Instead, trainees are guided by principles and strategies.

Example: Management trainees are able to design and implement a guidance programme for employees experiencing personal problems because of severe financial difficulties.
The learning situation should present problem situations that trainees approach with the help of general principles and strategies. Several solutions are possible. Correct application of principles and strategies as

well as the reasons given for this choice form the basis for evaluation.

The Learning Cycle

Kolb's cycle of experiential learning (1984) provides a multitude of design standards. The basic principle is that learning takes place throughout the entire four stages of the learning cycle. To achieve instructional objectives, trainees should therefore:
- gain experience
- reflect on this experience
- form theories to perform a taxonomy of these reflections
- apply new insights through experimentation
- gain additional experience through these experiments
- reflect this additional experience
- and so forth.

Each learning process based on this learning cycle will provide a constant flow of new experiences, reflections, theorising and experimentation.

The conventional training-within-industry (TWI) approach will be sufficient for mastering primarily psycho-motor technical and instrumental skills. This approach, also known as structured field training, consists of four stages:
- prepare trainee for the assignment
- demonstrate the operation
- try out performance
- follow up.

Matrices

Instructional matrices are useful tools for developers to design and classify learning situations. This method involves listing several possible learning situations for each instructional objective. An evaluation follows of these learning situations' practical feasibility according to the matrix of the educational blueprint. This method facilitates a creative approach to the instructional design process that maintains a balance between objectives and learning situations. Nevertheless, the developer's repertory of design methods still determines the final result's diversity. Practical procedures for the use of instructional matrices and morphological schemes are provided by Plomp (1986) and Kessels & Smit (1989a).

Output
This design step results in a curriculum consisting of:
- a programme with a name, goals, schedule, duration and content
- a description of learning situations and programme steps
- instructions to trainers, coaches and managers.

Remarks
The research that forms the basis for these design standards shows that learning situations that resemble the work environment result in successful educational programmes. A learning situation that closely resembles the work environment offers the following advantages:

a. Employees soon realise that the desired skills will be of use in their work environment.
b. The learning situation directly addresses problems with mastering new skills and improving performance in the work environment.

A learning situation resembles the work environment if:
- the learning situation takes place in a work environment related to what is being taught
- the learning situation addresses the cognitive operations required for performing tasks in the work environment
- the learning situation presents and explores the problems occurring in the work environment.

The learning situations should tie in with the instructional objectives. The systematic design approach described above requires a high degree of consistency between the various design steps. If the instructional objectives list the curriculum's target skills, the learning situations should make it possible to master these skills. A common problem is the absence of instructional objectives in designs of learning situations. Learning situations are often based on the scope of predefined training content in syllabi or books. Conventional combinations that do not reflect a specific need include:

- quality control programmes	→ definitions of quality
	→ statistical measuring techniques
- managerial courses	→ situational leadership
	→ McKinsey's 7-S-model
- communication training	→ messages and noise
	→ model for discussing bad news

The learning situations consist mostly of conveying information and content. The application of skills appropriate to the work environment thus takes second place.

The developer can emphasise a performance-based approach over an approach that focuses on information and content by consistently using the instructional objective (i.e. the skill) and the test of competence as a standard. While the training content may be crucial for mastering the skills, learning the content can never replace mastering the skills.

Further useful reading:

The problem of putting objectives in sequence and planning instructional strategies is addressed by Romiszowski (1981, pp. 187-307; 1984, pp. 49-172), Rothwell & Kazanas (1992, pp. 157-195), Tracey (1984, pp. 223-301), Patrick (1992, pp. 317-384), and Rowntree (1974, pp. 71-113).

The use of matrices as a tool for developing a programme outline is described by Plomp (1986), Kessels & Smit (1989a, pp. 91-109), and Norton (1985).

Overviews of learning theories have been published by Gagné (1973), Gagné & Glaser (1987) and Boekaerts & Simons (1993).

An overview of instructional theories is presented by Reigeluth (1983) as well as examples of instructional plans based on these theories (Reigeluth, 1987).
Joyce & Weil (1980) reviewed a large number of information-processing models, personal models, social interaction models, and behavioural models.

Simulator training and gaming are addressed by Lintern (1991), Debenham (1991), Romiszowski (1984, pp. 173-213), Duke (1983), Van Wierst & Geurts (1991), and Patrick (1992, pp. 487-512).

The following authors discuss principles of learning in the workplace: Marsick (1987), Marsick & Watkins (1990), Kruijd (1991), De Jong (1991), Versloot (1991), and Carr (1992, pp. 185-198).

Silberman & Auerbach (1990) describe many techniques, designs, and case examples for active training.

The design standards do not focus on the specific design requirements of computer assisted training and training of skills in fields of subject matter

expertise such as communication and interpersonal skills, language skills, commercial skills, computer skills, management skills. Nevertheless, the generic design principles described in these standards also apply to the specific subjects.

Step 8: Select and Instruct Trainers and Coaches

Step 8	Select and Instruct Trainers and Coaches
Goal	Select and instruct trainers and coaches capable of implementing the curriculum.
Operating Procedure	Select trainers and coaches with: = relevant subject matter expertise = practical experience = basic social skills Instruct these individuals regarding: = curriculum principles = execution of the curriculum = use of course material = management of instructional strategies = evaluating process and learning results
Output	One or several well-prepared trainers and coaches
Remarks	Implementation of the curriculum will proceed smoothly if trainers and coaches help design both the curriculum and the course material.

Explanation:

Goal:
Select and instruct trainers and coaches capable of implementing the curriculum. The selection and instruction processes serve to provide trainers and coaches that have the same views of the programme as the developer.

Operating Procedure:

Trainers and coaches are responsible for creating learning situations out of the formal curriculum. They need to be able to turn the insights and ideas that form the basis for the design into an actual learning pro-

gramme. Trainers and coaches should therefore remain thoroughly informed regarding these theories and ideas and possess the skills necessary to create the desired learning situations.

The developer can foster familiarity with his or her design by involving potential trainers and coaches in each of the design steps. These individuals may join the project team or assist in performing task analyses and formulating objectives. It is, however, essential to involve trainers and coaches directly in designing evaluation instruments, learning situations and course material. To produce these items, the developer's managerial technique should clearly reflect the underlying theories and ideas and should provide examples to reinforce them. Joint development of the material thus serves as intensive instruction.

Three categories of skills are necessary for the programme's execution:
= relevant subject matter expertise
= practical experience
= social skills

Trainers and coaches are not only counsellors, but serve as valuable sources of information as well. To this end, they must have relevant subject matter expertise that is sufficient to teach trainees both the underlying principles and the correct application of the skills.

Successful application of new skills in the work environment requires trainers and coaches to have experience with the work the trainees do. Practical experience provides trainers with examples, problems, applications, terminology, and cultural highlights to facilitate the learning process and to enhance application of the learning results. This experience will also help trainees view their trainer as an experienced colleague and make it easier for them to grasp the value of the educational programme.

There is a difference between relevant subject matter expertise and practical experience, as expertise alone will not ensure the educational programme's success. It appears that the lack of practical experience among trainers seriously hampers acceptance of the scope of programmes on management, computers, quality control, as well as training to promote social and communication skills. Trainers for these courses are frequently young intellectuals who have studied corporate science or social sciences, but lack formal experience as managers, systems controllers, project managers, department heads, and the like. Although their

relevant subject matter expertise makes them sources of information for managerial techniques, policy planning, computer support systems, project management, and communication skills, these individuals lack practical experience that is crucial for obtaining the recognition, acknowledgement, and motivation necessary for the actual application of new skills. The absence of recognition, acknowledgement, and motivation is a major transfer barrier among trainees.

These remarks need not *restrict* the instruction of courses in fields such as management and computers to experienced managers and computer scientists. It is, however, essential to the transfer conditions to include experienced professionals who are active in the relevant fields of these programmes.

In addition to subject matter expertise and practical experience, effective instruction and coaching require basic social skills. These qualities will help create safe environments for learning and working, give unbiased, unambiguous instructions, be sensitive to the behaviour of others, and provide constructive feedback as well as subtle encouragement, rewards, and corrections.

It is possible for detailed teaching instructions in the instructional material to mitigate the absence of specialized instructional or pedagogical skills. Developers cannot compensate for the absence of basic social skills by adding course material.

If it is not possible to include trainers and coaches in the design process, it is advisable to provide them with specific training on:
= specific curriculum principles
= execution of the curriculum
= use of course material
= management of various instructional events
= evaluating process and learning results

Using Line Managers as Trainers and Coaches

Given the previous remarks on the crucial role of trainees' managers in implementing the programme and the requirement that trainers have experience with the work of the trainees, line managers should figure prominently as trainers and coaches. Managers have a vested interest in seeing that their employees master skills relevant to their work. As

managers, they are best suited to guide staff members in carrying out their work. Involving managers in both the design and the execution of an educational programme significantly enhances its implementation. Managers' leading roles in the implementation and application processes produce the paradigm that inextricably links educating to managing, thereby exemplifying the increasingly important concept of organizational learning.

Output:
One or several well-prepared trainers and coaches to put the curriculum into action and pay special attention to the transfer process. Trainers' and coaches' perceptions of the programme reflect those of the developers.

Remarks:
This step contains repeated references to trainers and coaches, thus stipulating the workplace as a learning site in addition to conventional venues such as classrooms or conferences.

Further useful reading:

The topic of selecting and instructing trainers is addressed by Tracey (1984, pp. 344-366), Bennett (1991) and Truelove (1992, pp. 172-196)

Tracey (1984, pp. 351-352), Nadler & Nadler (1992) and Carr (1992) highlight the manager's training role.

Kinlaw (1989), Moorby (1991), and Verhoeven (1993) have published texts on mentoring and coaching.

Introductory readings for trainers new to the profession are provided by Rijkers (1991), Kessels & Smit (1991), Ellis (1988), and Munson (1992).

Step 9: Develop Training Materials

Step 9	Develop Training Materials
Goal	Develop material for carrying out the learning situations.
Operating Procedure	Analyse each of the suggested learning situations and investigate which aids will further the learning process.
Output	- study aids - a reference manual - job aids - exercises, assignments, case studies, role playing, games - visual aids, auto-instructional materials - demonstration materials, models, simulation equipment - trainers' and field instructors' guides
Remarks	The training material should be suited for use in the work environment.

Explanation:

Goal:
Develop material for carrying out the learning situations.

Operating Procedure:

Analyse each of the suggested learning situations and investigate which aids will further the learning process.
Which resources do trainers and field instructors need to prepare and carry out the learning situations?
Which resources will help employees master the desired skills?

Output:
Design training materials so that the educational programme can continue despite the absence of the developer, even if the developer is 'hit by a car'.

Depending on the instructional objectives and the learning situations, there are many options for training material. Popular methods include:
- study aids
- a reference manual
- job aids
- exercises, assignments, case studies, role playing, games
- visual and audio-visual aids
- auto-instructional material
- demonstration materials, models, simulation equipment
- trainers' and field instructors' guides

Remarks:
With a view to previous remarks on the close link between the learning situation and the work environment, it is important to bear in mind that training materials should be suited for use in the work environment.

Further useful reading:

Theoretical underpinning of the production of instructional materials is provided by Fleming & Levie (1978).

Tracey (1984, pp. 303-343), Bell (1991, pp. 439-467), Rothwell and Kazanas (1992, pp. 196-227) and Van Wart, Cayer & Cook (1992, pp. 182-231) offer practical applications.

Romiszowski (1986), Rowntree (1990), Elen, Lowijck & Van den Branden (1991), Pilot, Van Hout Wolters & Kramers Pals (1983), Van der Veen (1985), and Faber (1990) have published texts on the development of auto-instructional and reading materials.

Rossett & Gautier-Downes (1991) and Davies, Gray & Hallez (1990) have developed illustrated guidelines for the production of job aids and manuals.

Reiser & Gagné (1983), Romiszowski (1988), and Kearsley (1991) address the selection and use of instructional media.

Step 10: Create Favourable Conditions for Implementation

Step 10	Create Favourable Conditions for Implementation
Goal	Achieve circumstances conducive to implementing the design.
Operating Procedure	Report on the educational programme's goals and implementation to: - the top manager - trainees' supervisors - trainers - trainees - planners Arrange for facilities and aids.
Output	Conditions and circumstances that favour implementation
Remarks	Pay particular attention to: - supervisors - feedback procedures within the organization

Explanation:

Goal:
Achieve circumstances conducive to implementing the designed curriculum, not only in the classroom, but also in the work environment.

Operating Procedure:

Although "Creating Favourable Conditions for Implementation" is presented as Step 9, this activity should occur regularly and should play a key role throughout the programme. It is a prerequisite for influencing conditions of the organization and the immediate supervisors from the very beginning of the design process. To this end, keep both the top manager and the immediate supervisors up to date on possible sources of difficulty in applying new skills.

The description of the design steps should serve to create favourable conditions for implementation. The section on project management of these design standards specifically describes the treatment of the design steps as a project to promote implementation of the curriculum.

Robinson and Robinson (1989) distinguish three general types of conditions that might obstruct implementation of a programme design:

- conditions of the trainees
- conditions of the immediate supervisor
- conditions of the organization

Conditions of the Trainees

Trainees should:

- see payoff for using the new skills.
- possess enough self-confidence to apply the new skills successfully to their work.
- be able to tell whether they are applying the new skills successfully.
- experience as few failures as possible when applying these skills.
- be able to subscribe to the values and concepts being taught in the programme.
- be convinced that the new skills directly apply to their work.

Conditions of the Immediate Supervisor

The supervisor should:

- reinforce trainees' efforts to apply the new skills to their work.
- serve as a role model and show his or her support for the new skills.
- coach trainees in applying the new skills in specific on-the-job situations.

Conditions of the Organization

The organization should:

- enable trainees to apply new skills by providing the necessary time, means, physical environment, procedures, policies and authority.
- provide trainees with feedback on the impact of their application of new skills (such as reductions in complaints, malfunctions,

machine down-time, accidents, increases in sales and profits and improvements in quality and image).

- take care that the trainees do not suffer any negative consequences from applying the new skills (such as having to put in overtime or receiving negative reactions from their colleagues or from other departments).

The design of an educational programme should address these conditions. No matter how perfect programmes for corporate education may be, educational efforts are to no avail if a multitude of factors obstruct the application of skills to the work environment. Robinson and Robinson's research (1989) shows that especially conditions of the immediate supervisor and of the organization may severely hamper the transfer of the educational results to the work environment.

The top manager can take measures to improve the organizational conditions, while immediate supervisors are crucial in their capacity as role models and coaches.

Trainers can promote the transfer process by instructing trainees on the advantages and use of the new skills, ensuring positive reactions to their application, stimulating self-confidence, avoiding mishaps and discussing the educational programme's basic standards and values.

Before they begin, trainees should receive thorough instruction on the programme's objectives and underlying principles, its consequences for their practical work and the support they can expect from trainers, managers and experienced colleagues. It is the curriculum developer's responsibility to design a programme offering applicable skills with enough opportunities for practice to ensure sufficient mastery and useful educational materials.

Output:
Conditions and circumstances that favour the implementation of the curriculum. These conditions and circumstances are related not only to the programme design, but also to the workplace and the organization itself.

Remarks:
The design's special focus on supervisors and organizational feedback systems stems from the finding that conditions of these two areas frequently form barriers to the implementation of educational programmes.

Further useful reading:

Broad & Newstrom (1992) describe dozens of practical strategies for developers, trainers, managers and trainees to create favourable conditions for the implementation of a programme.

Van Wart, Cayer & Cook (1992, pp. 96-105) describe general policies and attitudes for gaining organizational support for training and development programmes.

Step 11: Select Trainees

Step 11	Select Trainees
Goal	Assemble a team of trainees from the original target group.
Operating Procedure	Establish selection criteria. Determine whether the candidates fit these criteria. Investigate favourable and unfavourable conditions for participation in the educational programme.
Output	A team of trainees that matches the intended target group
Remarks	Try to find trainees that meet the criteria of the original target group.

Explanation:

Goal:
Assemble a team of trainees to match the original target group.

Operating Procedure:

This step is easily confused with the search for a target group, which pertains to training needs assessment. That process describes which group the curriculum will address and makes it possible to modify or describe more specifically the target group through task analysis. Educational programme design requires a clear description of the target group. Selection of the trainees in this step serves to ensure that precisely those individuals for whom the curriculum was originally designed become the actual participants.

Several ulterior motives may come into play when individuals register for educational programmes:
- Certain employees may not have taken courses in a while;
- Employees have been making quite a few mistakes lately;
- Certain employees are due for promotions, which can be justified

by additional education;
- An employee is the oldest member of a group or the most senior member of a department;
- Management wishes to build up a reserve of qualified workers;
- Employees hope to command promotions through additional education;
- Employees need not fully master the intended skills, but would benefit from superficial knowledge;
- Employees from other departments are eligible for the programme;
- A (collective bargaining) agreement mandates a certain number of days per year of training for employees;
- The subject of the course applies only peripherally to the actual problem, but nothing more appropriate is available.

The systems approach to curriculum design is intended to solve specific problems by focusing on skills to enable staff members to implement the desired changes in their work environment. This need calls for a customised programme that will be effective only for staff members that are indeed capable of producing changes once they have mastered the skills at hand. This design step strives for a judicious selection of trainees within the target group.

Establish Selection Criteria

To ensure an unbiased selection of trainees, start by determining which criteria result from the training needs assessment. Answer the following questions:
- Which departments and work stations can help solve the problem at hand or achieve the goal that has been formulated?
- Which staff members can help achieve the changes desired in the work environment?
- Which staff members do not have (or are insufficiently familiar with) the skills necessary for bringing about these changes?

Determine Whether Candidates Fit These Criteria

Do candidates fit the preceding description of the target group? Do the appropriate staff members have the potential (ability and motivation) for completing the programme successfully?

In borderline cases, it is advisable to assess whether admitting a certain candidate who does not fit the criteria will have a negative impact on the learning process. Will possible mismatches lead to frustration among participants and trainers? Reach an understanding with the candidate regarding this eventuality. (Possible solutions might include dropping out of the course or completing different or modified assignments.)

Investigate Favourable and Unfavourable Conditions

In addition to determining whether candidates fit the target group, this selection should investigate favourable and unfavourable conditions for participation in the curriculum. How does their work environment respond to the programme?

Relevant questions include:

- Will candidates have enough time to attend the programme's activities and complete their assignments?
- Will candidates be able to complete assignments in their own work environments?
- Do their work environments provide positive reinforcement?
- Do both their home and work environments support participation in the programme?
- Are the candidates qualified to apply the skills learned in the educational programme in practice?

Output:
A group of trainees that corresponds to the original target group.

Further useful reading:

Selection of trainees is discussed by Tracey (1984, pp. 394-441) and Janes (1984).

Step 12: Conduct Training Programme

Step 12	Conduct Training Programme
Goal	Carry out the educational design.
Operating Procedure	Conduct pilots and trial runs. Test and revise the design when necessary. Adapt the design to the actual circumstances. Deliver and execute the programme according to the design specifications.
Output	Implementation of the tested curriculum Employees acquire new skills Improvements in the work environment A step towards solving the original problem
Remarks	Execution concerns both the off-site curriculum and the on-the-job curriculum.

Explanation:

Goal:
Carry out the educational design.

Operating Procedure:

It is appropriate to view the first or even the first few executions of the programme as pilots or trial runs. The design is tested and when necessary revised. This step should be carried out in conjuction with Step 13: Evaluate Process and Results.

Trainers need to become familiar with using the material, particularly in slightly unorthodox instructional strategies. The execution of a programme will never be completely identical to its design, as countless factors surface that were obscure or unknown during the design process. Following evaluation of each situation, trainers may also deviate from the original operating procedure.

Involving trainers in designing the programme (and especially the course

material) can avoid countless discrepancies between the formal curriculum and the programme in action. If developers have the necessary subject matter expertise and experience with the trainees' work, they should be the first to run the programme. Doing so will reveal whether its success or failure stems from design flaws or from discrepancies between the design and implementation processes as a result of differences of opinion between the developer and individuals running the programme.

Output:
Execution of the programme should produce the following results:

- A tested and revised curriculum, ready for delivery

- Implementation of the curriculum
  The formal curriculum, in documents, is put into action and transformed into an operational curriculum: the curriculum as it presents itself in the factual learning situations that are created, the interaction between trainer and trainee, the trainee working with the curriculum materials, and the learning processes that occur.

- Employees acquire new skills
  Employees have mastered the new skills sufficiently to apply them in the work environment if conditions are favourable.

- Improvements in the work environment
  In addition to providing employees with new skills, this type of curriculum should improve the work environment in accordance with the training needs. The acquisition of the appropriate skills should occur in conjunction with an effort to address necessary improvements in the operating procedure (both departmental and interdepartmental), task distribution, assignment of responsibility and authority, use of tools and job aids, appraisal, selection, performance feedback, task enrichment and job enlargement, and the provision of reference manuals. Improvements will only occur in the work environment if the educational efforts are an integral part of a more comprehensive approach to reconsider organizational features.

- A step towards solving the original problem
  The learning situations in a consistent educational design will produce new skills. These new skills will improve the work

environment if the workplace provides adequate support for these improvements. An improved work environment will help solve the original problem.

Remarks:
Execution concerns both the off-site curriculum and the on-the-job curriculum.
Effective execution of the educational design with respect to the work environment requires support for the learning process through activities that facilitate application of the skills.

Further useful reading:

In addition to the references made in *Step 7: Design Learning Situations* and *Step 9: Develop Training Materials*, the following texts apply to programme execution:

Practical strategies and tips appear in Van Wart, Cayer & Cook (1992, pp. 235-248).
Boud, Keogh & Walker (1987) have published a set of texts on different types of reflective activity and areas related to the process of reflection, which describe educators' methods and the issues they consider crucial.

Step 13: Evaluate Process and Results

Step 13	Evaluate Process & Results
Goal	Establish whether the learning process has been successful. Establish whether the intended learning results have been achieved.
Operating Procedure	Evaluate the process. Conduct the test of competency.
Output	Suggestions for improving the educational design. Proof of whether trainees have indeed mastered the required skills.
Remarks	This step uses the instruments designed in Step 6.

Explanation:

Goal:
Establish whether the learning process has been successful.
Establish whether the intended learning results have been achieved.
Provide suggestions for improving the educational programme.

Operating Procedure:

Use the instruments for process evaluation and the test of competency from Step 6 to evaluate the educational programme. These instruments will reveal the course of the learning process and the degree to which employees have mastered the desired skills.

Output:
Suggestions for improving the educational design
Proof of whether trainees have indeed mastered the desired skills

Remarks:
Include the trainees' workplace in the process evaluation, as this location

is where a significant portion of the learning process has occurred.
Involve trainees' line managers in the administration of the test of competency. Assistance from these individuals increases the likelihood that the new skills will be applied in the work environment.

Further useful reading:

In addition to the references for *Step 5: Evaluation Criteria* and *Step 6: Evaluation Instruments*, we include some texts on formative evaluation.

Rothwell & Kazanas (1992, pp. 228-245) include four approaches to formative evaluation:
1. expert reviews
2. management or executive rehearsals
3. individualized pretests and pilot tests
4. group pretests and pilot tests.

King, Morris & Fitz-Gibbon (1987) describe a systematic approach to procedures for planning, data collection, and analysis of programme implementation.

Thijssen (1989) introduces the thermostat concept for formative evaluation based on self assessment by students and expert evaluation of curriculum elements.

Dick (1977) describes three stages of formative evaluation. The first stage involves preliminary or one-on-one evaluation. After revision comes Stage 2, which consists of small-group evaluation. After further revision, a field trial is conducted (Stage 3). This final stage is the most formal of the three and is to be conducted in a similar fashion as the summative evaluation at the end of the programme.

Step 14: Evaluate Performance and Impact

Step 14	Evaluate Performance and Impact
Goal	Establish whether the work environment has changed. Determine whether the original goal has been achieved. Investigate whether the original problem has been solved.
Operating Procedure	Use the evaluation instruments to assess: - work environment - impact
Output	Information about changes in the work environment Information about the organizational impact Suggestions for improving the solutions to the organizational problem
Remarks	This step uses the instruments designed in Step 6.

Explanation:

Goal:
Establish whether the work environment has changed.
Determine whether the original goal has been achieved.
Investigate whether the original problem has been solved.

Operating Procedure:

This evaluation step should reflect the original training needs. The training needs assessment investigated the interaction between problem, work environment, skills, and learning situation. This evaluation step serves to determine whether the new skills have brought about changes in the work environment and have had an impact on the organization. Use the evaluation instruments from Step 6 to gather information on the work environment and impact to establish these causal relationships.

Vast differences between the goals and the resulting effects in work environment and organizational impact require careful consideration of both the problem-solving approach and the accompanying educational design.

Output:
Information about changes in the work environment
Information about the organizational impact
Suggestions for improving the solutions to the organizational problem.

Further useful reading:

In addition to the references for *Step 5: Evaluation Criteria* and *Step 6: Evaluation Instruments,* we include some texts on effect evaluation and on the intructional management system.

Effect evaluation:
According to Cummings & Park (1991), one of the reasons companies do not measure the impact of training against predetermined performance goals is the inability of supervisory personnel to evaluate work and to write performance standards for their own units or their employees. That is probably why in the United States the following limited practice of training evaluations is reported:
- assessment of trainee satisfaction: 63.5%
- assessment of trainee terminal knowledge: 19% post testing
- assessment of change in knowledge: 8% pre testing and post testing
- assessment of behavioural change: 10%
- assessment of organizational results: 4.9%.

Instructional management system:
Rothwell & Kazanas (1992, pp. 249-263) address aspects such as entrance into the instruction, documentation and recordkeeping.

15.4 Cost-Benefit Analysis

It is often argued that educators should provide proof of the return on investment in training. However, in practice this is seldom the case. Senior executives rarely urge training mangers to calculate their contribution to the organization. When they do, they have been dissatisfied with the performance of the training function for some time. Investigating the return on investment thus becomes an easy way to infer evidence.

While there is a desire to express indicators such as
- increased sales volume
- decreased rejection rate
- increased output
- decreased production costs
- increased number of new customers
- decreased waste

in financial terms, these changes hardly ever result exclusively from educational efforts.

Top managers rarely take decisions on whether to run a specific training programme solely on the basis of financial forecasting. The credibility of the developer and the arguments used (and especially the manager's intuitive feeling for relevance) have a greater impact on the decision-making process than a sophisticated cost-benefit sheet (also see Kirrane, 1986, pp. 24-27).

Cost Analysis

However, cost calculations *are* relevant for the development process. Training development is a costly affair. First, the project manager needs to draft a proposal for the resources required so that the necessary means may be allocated. Second, cost-effective training designs generate the best effect at the lowest costs. As trainees' salaries and their opportunity costs (the loss of potential contribution to the organization) are the largest cost factor in corporate education, the programme with the shortest training time per trainee is the least costly.

For example:
25 managers have to be trained in negotiating skills.
Salary and opportunity costs of each manager are estimated at
Fl. 2,000.00 per day.

Salary and opportunity costs of the trainer are equally estimated at Fl. 2,000.00 per day.
The training programme lasts four days.

The approximate costs involved are:

25 (trainees) x 4 (days) x Fl. 2,000.00	=Fl. 200,000.00
1 (trainer) x 4 (days) x Fl. 2,000.00	= 8,000.00
Total cost	Fl. 208,000.00

Changes in programme design might enhance effectiveness if the training takes place in groups of 5 managers. Time available for practice (necessary for acquiring negotiation skills) will increase nearly fivefold. Even if the training time is reduced to 2 days, the managers are still provided with more time for practice than in a group of 25 over 4 days. The cost of the second training design is:

5 (groups) x 5 (trainees) x 2 (days) x Fl. 2,000.00	=Fl. 100,000.00
5 (groups) x 1 (trainer) x 2 (days) x Fl. 2,000.00	= 20,000.00
Total cost	Fl. 120,000.00

In spite of the increased costs of trainer salaries, the total costs are reduced by Fl. 88,000.00. Intensive practical work has actually improved the effect.

This type of reasoning justifies the development of expensive educational equipment, software and simulators, as long as the design reduces trainee time and increases effectiveness. As group size and course length are cost factors that proportionally affect the overall costs most, cost-effective training design should be based on a number of calculations, minimally those in the following cost sheet (Figure 15-5).

A: Trainee costs:	- salary - opportunity costs* - travel expenses - accommodation
B: Programme costs:	- trainer: - salary - opportunity costs - travel expenses - accommodation - facilities: - conference rooms - (rent) training aids - course material - overhead: - training department**
C: Development costs:	- salaries of developers - salaries of subject matter experts - travel expenses - operating expenses - production costs of items such as software, games, simulators
D: Special costs:	- specific equipment - research costs - miscellaneous

Figure 15-5: Work sheet for cost analysis

* Opportunity costs can consist of:
- cost of replacement
- portion of extra fulltime replacements on the payroll to enable staff members to attend training courses regularly
- slow-down factor for absence (the longer the training, the more heavily the department is burdened by the absence of the trainee)
- equivalent of salary, fee or lost earnings (including consultants, maintenance personnel, medical specialists)

** Overhead cost of the training department is estimated at a fixed amount per day. Overhead indicators are based on annual department costs that cannot be charged to a specific programme.

It is important to distinguish cost categories A and B clearly, which

depend on the number of trainees, and categories C and D which are trainee independent. As trainee-dependent costs make up the largest portion of training costs, it is critical to control these costs through sophisticated designs, even if this increases trainee-independent costs (C and D). An expensive training simulator is therefore justified when the application of this technology decreases trainee-dependent costs and still provides a highly effective programme. The cost work sheet allows comparison of design alternatives, as well as rational decision-making, on the basis of cost reduction.

Furthermore, comparison of costs between various designs makes it possible to calculate cost ratios, such as:
- cost per trainee
- equipment cost per trainee or per hour
- material cost per trainee
- development costs per programme.

Benefit Analysis

We stated that, in corporate education, the relevance of hard-nosed benefit analysis and return on investments ratios should not be overestimated. From the perspective of the generic principles discussed in Section 15.1 of this chapter, the policy on educational benefits can be stated as follows:

1. What is the problem to be solved?
   What goal is to be achieved?
2. In what terms does the responsible top manager value an adequate solution?
3. Which skills are needed to contribute to that solution or goal?
4. What are the costs of acquiring these skills?
5. Are there alternatives to the proposed skills?
6. Are there alternative training designs that provide opportunities for practising these skills?
7. Which alternative (from 5 or 6) best justifies the costs in view of the top manager's value (2) of the desired solution or goal (1)?

This policy shows that the analysis of training benefits is the manager's responsibility rather than the developer's. Here, the same reasoning applies as to the creation of favourable transfer conditions in the work environment. The manager is responsible for effecting changes in the

performance of staff members and the department. Although designing an effective learning environment is the educator's expertise, he or she can not overrule the managers in charge or do their jobs. The educator takes a consultant's attitude towards transfer conditions and towards benefit analysis: providing valid information, effective interventions, and coaching for implementation.

Some final remarks describe the intangible costs of an educational provision. Though often neglected and difficult to quantify, they have a great impact on the results and on the participation in future programmes.

What pains do employees take to complete the training programme?
What is the amount of overtime, travel time, nights spent away from home and mental efforts necessary for full participation in the programme?

These potential drawbacks will increase when:
- trainees consider the programme irrelevant;
- trainees consider the application of the skill unfeasible;
- trainees are demotivated by the learning process;
- trainees have had negative training experiences.

When trainees are forced to pay these intangible expenses for training programmes that are not based on a genuine need, their commitment to the organization will decrease. The resulting negative attitude will have a negative impact on performance.

Further useful reading:

Kearsley (1982) developed four cost models for training purposes: the cost model, the life-cycle model, the benefits model and the productivity model. However, these models pay little attention to the trainee salaries, that are a major cost factor. Kessels & Smit (1989a) reviewed Kearsley's cost models.

Swanson & Gradous (1990) offer a rich source book on cost-benefit analysis. It contains many work sheets for specific training programmes and calculation purposes. The models from this book can also be purchased as a software package.
Additional work sheets for calculating training costs are provided by

Phillips (1983), Robinson & Robinson (1989, pp. 276-278), Rothwell & Kazanas (1992, pp. 113-114) and Tracey (1984, pp. 487-490).

The issue of the return on investment problem is widely covered by Carnevale and Schulz (1990). They introduce a consensus accounting model for training purposes.
Brinkerhoff (1988, pp. 161-191) demonstrates several ways of reasoning for assessing the financial benefits of a training programme and devotes an entire section to comparing alternative training designs (pp. 70-93).

Harrison (1992, pp. 382-390) describes five strategies for assessing benefits:

- the value for money strategy compares costs and benefits and assesses whether other types of learning events are likely to be more cost-beneficial;
- the investment value strategy goes further and questions the objectives' necessity and relevance;
- in the objective-centred strategy, the key parties must agree and be committed to the way or ways in which people will be educated to meet the objectives; there must be a joint assessment of the costs and likely results of a variety of approaches;
- the auditing strategy explores the extent to which the objectives in certain predefined areas of corporate education have been met;
- the business-led strategy explores the contribution of training and development to corporate strategy and its resulting objectives.

Van Kooten (1993) has developed a benefit model in which economic factors such as Pay Out Time, Net Present Value, and Earning Power appear in combination with coefficients for contribution, improvement, spin-off and learning curve. The model provides a basis for intelligible discussions with finance managers.

Introductory readings are provided by Spencer (1986), Patrick (1992, pp. 530-533), Dahl (1987, 343-348) and Mulder (1988).

SAMENVATTING

Introductie

Het doel van deze studie is het ontwerpen van praktische aanwijzingen die gebruikt kunnen worden bij het ontwikkelen van bedrijfsopleidingen. Economische, sociale en culturele bewegingen in de samenleving creëren een voortdurende noodzaak tot aanpassing aan veranderende omstandigheden. Het leren wordt beschouwd als een belangrijk voertuig dat organisaties helpt bij het implementeren van de structurele, technologische en culturele transformaties, die noodzakelijk zijn om te kunnen overleven en te groeien.

Zelden is het belang van het leren ter discussie gesteld. Er groeit echter een toenemende twijfel aan het effect van de activiteiten die erop gericht zijn het leren te bevorderen. Bedrijfsopleidingen vergen een aanzienlijk deel van de capaciteiten en budgetten, terwijl de middelen schaars worden in perioden van economische neergang. De noodzaak tot succesvolle aanpassing en dus ook tot leren is echter juist zeer urgent in dergelijke periodes van economische instabiliteit. Op het ogenblik wordt het leren alom gezien als een voorwaarde voor overleving en verandering en staan begrippen als 'leren te leren' en 'de lerende organisatie' in een hernieuwde belangstelling.

Curriculumontwerp

Curriculumontwerp speelt een belangrijke rol in het creëren van een educatieve omgeving die tegemoet komt aan de noodzaak tot leren. Descriptieve theorieën met betrekking tot het leren zijn beschikbaar, echter de prescriptieve theorieën en daarop gebaseerde ontwerpvoorschriften zijn schaars.

Deze studie probeert gedeeltelijk in deze leemte te voorzien en verschaft zowel een theoretische als een empirische basis voor ontwerpvoorschriften die leiden tot doelgerichte en kosten-effectieve leersituaties. Dergelijke leersituaties zijn niet beperkt tot die in het klaslokaal. In principe biedt een organisatie een uitgebreide variatie aan leer-mogelijkheden. De literatuurstudie ondersteunt onze praktijkervaringen dat vooral die leeromgeving buiten het klaslokaal een dominante rol vervult bij het teweeg-

brengen van de gewenste effecten van doelbewust georganiseerde leersituaties.

Ontwerpvoorschriften voor bedrijfsopleidingen richten zich in de eerste plaats op het verwerven van vaardigheden die ondersteund worden door de werkomgeving; het gaat om vaardigheden die veranderingen teweeg brengen in het functioneren van medewerkers en daardoor een impact hebben op de organisatie. Het kennisbestand met betrekking tot het reguliere onderwijs verschaft een brede theoretische basis voor dergelijke ontwerpvoorschriften. De complexe mechanismen binnen bedrijfsopleidingen, waar cognitieve operaties met betrekking tot het individuele leren verstrengeld zijn met de sociale processen van de organisatiecontext, vragen echter om een uitbreiding van dat kennisbestand. Een uitbreiding die niet alleen succes en falen verklaart, maar die ook de resultaten van nieuw te nemen acties voorspelt. Een dergelijke studie behoort echter waakzaam te zijn voor de onbescheidenheid een alomvattende theorie te presenteren, die pretendeert alle problemen in dit werkterrein op te lossen. Een dergelijke studie naar ontwerpvoorschriften kan ook niet uitvoerig ingaan op het gedrag van opleiders en op de achtergrondvariabelen van cursisten, zoals leeftijd, geslacht, intelligentie, culturele diversiteit en voorgaande opleidingen.

Bedrijfsopleidingen voorzien in intentioneel ontworpen leersituaties die gericht zijn op het bereiken van effecten op het gedrag van zowel individuen als van de organisatie. Daarom zal een theorie voor curriculumontwerp niet alleen aanwijzingen moeten bevatten voor het ontwikkelen van leermateriaal, maar ook werkwijzen moeten beschrijven die betrekking hebben op strategische onderwerpen van de organisatie, op structurele terugkoppelingsmechanismen en op het ontwerpen van een werkomgeving die constructieve educatieve waarden draagt.

Onderzoeksvragen

Daar het doel van deze studie is om een prescriptieve theorie en gevalideerde ontwerpvoorschriften te ontwikkelen voor bedrijfsopleidingen, staan de volgende onderzoeksvragen centraal:

1. Welke faktoren in het curriculumontwerp beïnvloeden de kwaliteit van bedrijfsopleidingen?
2. Op welke wijze zijn deze faktoren werkzaam?
3. Kunnen ontwerpvoorschriften invloed uitoefenen op die faktoren?

Curriculumconsistentie

In de context van bedrijfsopleidingen is het begrip curriculum gedefinieerd als:
- een reeks van activiteiten die een organisatie ter beschikking staat
- om de noodzakelijke vaardigheden van medewerkers te beïnvloeden
- die bijdragen tot doelgerichte veranderingen in hun functioneren en in hun werkomgeving
- met het doel een gewenste impact op de organisatie teweeg te brengen
- door de toepassing van geplande leersituaties en de leerprocessen die daarvan het gevolg zijn.

Als leidraad bij het zoeken naar antwoorden op de onderzoeksvragen is een curriculumtypologie ontwikkeld. De typologie onderscheidt in beginsel twee cruciale curricula:
- het ideale curriculum: dat wat gerealiseerd zou moeten worden om de gewenste impact op de organisatie teweeg te brengen, en
- het bereikte curriculum: dat wat uiteindelijk gerealiseerd is.

In de ontwikkelde theorie is het concept van de curriculum consistentie het centrale begrip. Dit begrip heeft betrekking op de uiteindelijke overeenkomst tussen het ideale en het bereikte curriculum.

Externe consistentie duidt op de samenhang die er bestaat tussen de opvattingen van het (top) management, de ontwerper, de chefs van de cursisten, de opleiders en de cursisten, over de aard van het probleem dat opgelost dient te worden, over de doelen die daartoe nagestreefd worden en over de wijze waarop dat zal moeten geschieden.

Behalve externe consistentie tussen de opvattingen van de bovengenoemde actoren moet een curriculum ook consistent zijn in zichzelf. Dit concept van *interne consistentie* heeft betrekking op de logische contingenties tussen:
- de veranderingen die nodig zijn in de werkomgeving
- de noodzakelijke vaardigheden van managers en medewerkers om die veranderingen teweeg te brengen
- en de leersituaties die het verwerven van die vaardigheden bevorderen.

Interne consistentie impliceert ook dat, vice versa,
- leerprocessen medewerkers in staat stellen om

- vaardigheden te verwerven
- die hun functioneren beïnvloeden, op zodanige wijze dat
- de veranderde werkomgeving
- een impact heeft op de organisatie.

Het concept van de curriculumconsistentie - de overeenkomst tussen de verschijningsvormen van een curriculum en de contingenties tussen zijn elementen - is een verdere uitwerking van het evaluatie-model van Stake (1973). Het begrip curriculumconsistentie vormt in deze studie de conceptuele basis voor de beschrijving van de kwaliteit van bedrijfsopleidingen.

Ontwerpbenaderingen

Het hoofddoel van het ontwikkelen en toepassen van ontwerpvoorschriften is het bevorderen van de interne consistentie van een leerplan en het streven naar een sterke consistentie tussen de opvattingen van de aktoren over dat leerplan, om zo de overeenkomst tussen het bereikte en het ideale curriculum na te streven.

Als ontwerpvoorschriften de curriculumconsistentie moeten beïnvloeden en bevorderen, dan dient zich de vraag aan welke mechanismen interne en externe consistentie veroorzaken. De theorie die hier ontwikkeld is, staat een systematische en een relationele benadering voor die samen een krachtige combinatie van systeemdenken en sociale integratie vormen. Het is deze combinatie van een systematische en een relationele benadering in de ontwerpvoorschriften die verantwoordelijk wordt gesteld voor beide typen van curriculumconsistentie en uiteindelijk voor kwalitatief hoogwaardige bedrijfsopleidingen.

Systematische benadering

De systematische benadering impliceert een logische ontwerpvolgorde van oriëntatie, ontwerp, ontwikkelen, implementatie en evaluatie. Specifieke instrumenten die daarbij gebruikt worden zijn het vaststellen van de opleidingsnoodzaak, het uitvoeren van taakanalyses, het formuleren van leerdoelen, het toepassen van leerstrategieën, het samenstellen van opleidingsmateriaal en handleidingen voor docenten en coaches, en het construeren van evaluatie-instrumenten. De systematische benadering, mits vaardig toegepast, leidt tot een goed gestructureerd en logisch

geordend ontwerp-programma op papier. Naar dit produkt wordt steeds verwezen als het formele curriculum.

Relationele benadering

De relationele benadering omvat activiteiten die de actoren uitnodigen om betrokken te raken bij het ontwikkelproces en de implementatie, en die hen aanzetten om hun opvattingen over het ideale curriculum uit te spreken. Als de wederzijdse opvattingen eenmaal expliciet zijn, kunnen ze bijgesteld worden en langzaam maar zeker in overeenstemming met elkaar komen. De relationele benadering richt zich in het bijzonder op de betrokkenheid van de bedrijfsleiding bij opleidingen. De relationele benadering, mits vaardig toegepast, leidt tot een sterke externe consistentie tussen de opvattingen van de actoren over het leerplan.

Twee empirische onderzoeken

De basis voor ontwerpvoorschriften die curriculumconsistentie bevorderen ligt in bestaande theoretische inzichten en in de analyse van empirische resultaten. Het empirisch onderzoek van deze studie omvat vier hoofdfasen: de analyse van 17 contrasterende cases, het ontwikkelen van ontwerpvoorschriften, het opleiden van 30 ontwerpers in het gebruik van die voorschriften, en tenslotte de ontwikkeling, implementatie en evaluatie van 28 nieuwe curriculumprojecten.

17 Cases

De cases hadden betrekking op bestaande opleidingsprogramma's in acht verschillende organisaties en waren verdeeld in twee contrasterende groepen van acht succesvolle en negen niet-succesvolle programma's. De cases zijn onderzocht op interne en externe consistentie, en op de toegepaste systematische en relationele benadering. De gevonden karakteristieken zijn gerelateerd aan de bereikte effecten. De succesvolle cases lieten een sterke interne en externe consistentie zien. Zij werden ook gekenmerkt door een sterke systematische en relationele benadering. Bij de niet-succesvolle programma's konden die kenmerken in veel mindere mate waargenomen worden.

Het ontwikkelen van ontwerpvoorschriften

De resultaten van de cases leverden, als aanvulling op de theoretische verantwoording, de empirische basis voor een nieuwe reeks ontwerpvoorschriften. In deze ontwerpvoorschriften zijn de systematische en relationele benaderingen geïncorporeerd. De systematische en relationele benaderingen zijn in het tweede empirische onderzoek opnieuw getoetst en gerelateerd aan de opvattingen over de bereikte effecten.

Opleiding van 30 ontwikkelaars

Bij de start van het tweede empirische onderzoek zijn 30 ontwikkelaars opgeleid in het gebruik van de ontwerpvoorschriften. De opleiding speelde zich af in een periode van acht maanden, waarin de deelnemers gelijktijdig aan de ontwikkeling van hun projecten werkten. Tijdens de opleiding werden 28 curriculumprojecten afgerond. Het grootste deel van deze projecten werd tijdens de periode van het onderzoek geïmplementeerd in de eigen organisatie.

28 Curriculumprojecten

Behalve als replicatie van het case-onderzoek diende het tweede onderzoek ertoe om de volgende hypothese te toetsen: Een vaardige toepassing van ontwerpvoorschriften, die gebaseerd zijn op een systematische en een relationele benadering, levert opleidingsprogramma's op die betere resultaten boeken dan programma's die niet door dergelijke ontwerpbenaderingen ondersteund worden. Van de 28 ontwikkelde projecten werden er tijdens de duur van het onderzoek 17 geïmplementeerd, zodat van deze ook de gegevens met betrekking tot de externe consistentie en de gepercipieerde effecten beschikbaar waren.

Samenvatting van de resultaten

Voor zover de beperkingen van het onderzoek het toestaan, kunnen de onderzoeksvragen nu als volgt beantwoord worden:

Vraag 1:
Welke faktoren in het curriculumontwerp beïnvloeden de kwaliteit van bedrijfsopleidingen?

De paradigma's van de curriculumconsistentie theorie zijn:

A: Systematische benadering
De systematische benadering genereert logische contingenties tussen voornemen, leerdoelen, evaluatie-criteria en -instrumenten, en opleidingsactiviteiten. De systematische benadering brengt een intern consistent curriculum tot stand en maakt krachtige educatieve interventies mogelijk. Daardoor bevordert een intern consistent curriculum het verwerven van nieuwe vaardigheden, de verbetering van het functioneren en een positieve impact op de werkomgeving.

B: Relationele benadering
De relationele benadering stimuleert de betrokkenheid van de leiding en van teamwerk tijdens het ontwerpproces en de implementatie. Het bevordert de inschakeling van docenten met praktische ervaring in het op te leiden vakgebied en creëert leersituaties die lijken op de werksituatie. De relationele benadering genereert externe consistentie, wat gedefinieerd is als homogene opvattingen van de betrokken partijen over wat het probleem is en hoe het opgelost kan worden door middel van educatieve voorzieningen. Als managers, chefs, ontwerper, docent, en cursisten coherente opinies delen over de bedoeling en over de middelen om dat doel te bereiken, dan zal hun gezamenlijke inzet leiden tot een succesvolle implementatie van een programma, tot gunstige transfer condities en uiteindelijk tot positieve effecten.

De twee onderzoeken hebben een empirische ondersteuning geleverd voor de werking van de systematische en de relationele benadering. De praktische ervaring van de docent en externe consistentie blijken belangrijke voorwaarden te zijn opdat het intern consistente curriculum zijn werk kan doen. Als aan deze voorwaarden niet voldaan is, kan een intern consistent curriculum zelfs contra-produktief werken.

Vraag 2:
Op welke wijze zijn deze faktoren werkzaam?
De systematische benadering vergt een logische en een intellectuele inspanning. De ontwerper verzamelt informatie over de gewenste resultaten en de doelgroep, analyseert, ontwerpt een plan, kiest instructiestrategieën en stelt lesmateriaal samen. Intellectuele veelzijdigheid en vaardige toepassing van instructie-theorie zijn daarbij de belangrijkste ingrediënten. Inspanningen ten behoeve van een systematische benadering verhogen proportioneel de interne consistentie van een curriculum.

Aangenomen is dat een intern consistent curriculum de efficiënte verwerving van nieuwe vaardigheden bevordert.

De relationele benadering bevat sociale interventies en vaardige communicatieve interacties. De ontwerper organiseert vergaderingen en voert gesprekken met managers, chefs, medewerkers, potentiële cursisten en opleiders. De werkwijze bestaat uit het adviseren van belanghebbenden, het oplossen van problemen, onderhandelen, het bereiken van consensus, het verwerven van ondersteuning, en het toepassen van zachte druk. Deze inspanningen leiden tot homogene opvattingen tussen de betrokken partijen over hoe het probleem op te lossen, hoe het programma te implementeren, en hoe gunstige transfer voorwaarden te scheppen in de werksituatie. Uitgangspunt is dat externe consistentie de omzetting bevordert van leerresultaten in verbeterd functioneren. De betrokkenheid van het management en de nauwe verbindingen met de werksituatie zijn essentieel voor het ontstaan van externe consistentie.

De onderzoeksresultaten wijzen erop dat externe consistentie inderdaad een voorwaarde is voor de optimale opbrengst van het formele curriculum. Het blijkt echter, dat de externe consistentie niet proportioneel toeneemt met de hoeveelheid energie die de ontwerper steekt in de relationele benadering.

Een verklaring is dat het niet voor de hand ligt dat een ontwerper, in het kader van één enkel programma, veel externe consistentie bereikt als de omringende organisatie niet reageert. Als de opleidingsfunctie een geïsoleerde positie inneemt, of lijdt aan een negatieve beeldvorming, dan zullen de eerste pogingen tot een relationele benadering nog niet veel vruchten afwerpen. "It really does take two to tango". Het is onmiskenbaar dat, los van de inductieve activiteiten van een enkele programma-ontwikkelaar, een organisatie het meeste profiteert van een relationele benadering, als op bestuurlijk niveau het opleidingsbeleid een geïntegreerde ontwerpbenadering propageert. De kwaliteit van bedrijfsopleidingen is dus niet uitsluitend afhankelijk van de vaardige toepassing van de systematische en relationele benadering door de ontwerper, maar veeleer van het educatieve klimaat in een organisatie waarin een dergelijke geïntegreerde benadering tot zijn recht kan komen.

Vraag 3:
Kunnen ontwerpvoorschriften invloed uitoefenen op deze faktoren?

De ontwikkelaars die aan het tweede onderzoek hebben deelgenomen, zijn opgeleid in het toepassen van de nieuwe ontwerpvoorschriften. De leerplannen die zij samengesteld hebben, zijn beoordeeld door ervaren en gewaardeerde professionals uit het opleidingsvak. De gemiddelde waarden die zij toegekend hebben, aan zowel de systematische benadering, de interne consistentie en de relationele benadering, als aan de samenstellende elementen, voldeden alle aan het minimum criterium van >3.00 op een vijf-punt schaal. Bij het onderzoek naar het effect van de programma's bleek eveneens dat alle projecten aan het succes-criterium (>3.00 op een vijf-punt schaal) voor effectiviteit voldeden. Op drie na voldeden alle projecten aan het minimum criterium voor externe consistentie, eveneens >3.00 op een vijf-punt schaal.

De kosten-batenanalyse is een onderdeel dat blijkt het eenvoudigst te beinvloeden door ontwerpvoorschriften. De scores van deze variabele waren het hoogst. Dit was temeer opvallend omdat in de voorafgaande case studies dit onderdeel zeer zwak naar voren kwam. Het al dan niet uitvoeren van een kosten-batenanalyse heeft echter geen significante impact op de programma-effecten.

De aanwijzingen met betrekking tot de systematische benadering zijn succesvol toegepast en zij hebben programma's voortgebracht die in hoge mate intern consistent zijn. Deze hoedanigheid heeft een besliste impact op de effecten, mits het programma ingebed is in een extern consistente omgeving.

De aanwijzingen die de ontwerper aanzetten tot een relationele benadering zijn goed overgenomen. In de projecten kon echter de beoogde invloed op de externe consistentie en het effect niet worden vastgesteld wegens psycho-metrische beperkingen in de data, veroorzaakt door een kleine spreiding, $s = .36$ van de variabele relationele benadering, en $s = .26$ van de variabele effect. Vergelijkbare prestaties in de cases toonden wel duidelijke effecten op de externe consistentie en op de resultaten van het programma.

Externe consistentie blijkt van bepalend belang te zijn voor succesvolle implementatie van een programma. Zoals gesteld, kan de ontwerper deze karakteristiek echter niet eenzijdig beïnvloeden door eigen activiteiten. Externe consistentie wordt mede bevorderd door een positief klimaat ten

gunste van het leren en door een actief opleidingsbeleid op bestuurlijk niveau. Een ontwerper kan deze faktoren niet veranderen in het kader van één enkel opleidingsontwerp. Echter het regelmatig toepassen van een geïntegreerde ontwerpbenadering gedurende een langere periode zal hoogst waarschijnlijk externe consistentie bevorderen en positieve opleidingseffecten mogelijk maken.

In het licht van het bovenstaande is het antwoord op de derde onderzoeksvraag als volgt: De ontwikkelaars hebben de ontwerpvoorschriften, die hen ter beschikking werden gesteld, binnen een periode van acht maanden onder de knie gekregen en met succes toegepast. De programma's die met behulp van de ontwerpvoorschriften ontwikkeld werden, zijn effectief gebleken, zoals gepercipieerd door de betrokken actoren.

Herziening van de ontwerpvoorschriften

Aan het begin van deze studie was gepland dat de ontwerpvoorschriften herzien zouden worden op grond van de resultaten uit het tweede empirische onderzoek. Elk curriculum werd op 26 elementen beoordeeld, die correspondeerden met onderdelen uit de ontwerpvoorschriften. Het criterium voor revisie (< 3.50 op een vijf-punt schaal) was op geen enkel element van toepassing. Het element met de laagste gemiddelde score had betrekking op de consistentie tussen evaluatie-criteria en de voorgaande elementen opleidingsnoodzaak en leerdoelen. In de herziene versie van de ontwerpvoorschriften is dit element, ondanks het voldoen aan het gestelde criterium, toch opnieuw bezien. Ook de opleiding voor ontwikkelaars is op dit moeilijke onderdeel aangepast.

Aan de ontwikkelaars is gevraagd om de ontwerpvoorschriften te evalueren op de bruikbaarheid in de praktijk. Ook zij hebben enkele wijzigingen voorgesteld in de vormgeving en de volgorde van enkele aanwijzingen. In de nieuwe versie zijn deze suggesties overgenomen. Verder is in de eindversie bij elke ontwerpstap een paragraaf opgenomen met referenties aan relevante literatuur. In de opleiding voor ontwikkelaars is een selectie uit deze aanvullende literatuur-bronnen ter beschikking gesteld. De uitgebreide versie nodigt hopelijk uit tot verdere praktische toepassing, tot nader onderzoek en tot stimulerende bijdragen van collega's.

REFERENCES

Akker, J. J. H. van den (1988). *Ontwerp en implementatie van natuuronderwijs* [Design and implementation of science education]. Amsterdam: Swets & Zeitlinger.

Andrews, D. H. & Goodson, N. D. L. (1980). A comparative analysis of models of instructional design. *Journal of Instructional Development, 4*, 2-16.

Annett, J. (1991). Skill Acquisition. In J. E. Morrison (Ed.), *Training for performance.* (pp. 13-52). Chichester: John Wiley & Sons.

Annett, J., Duncan, K. D., Stammers, R. B. & Gray, M. J. (1971). Task analysis. In *Training Information*, 6. London: HMSO.

Argyris, C. (1982). *Reasoning learning and action.* San Francisco: Jossey-Bass.

Argyris, C. (1986). Skilled incompetence. *Harvard Business Review, 55*, (5), 87-99.

Argyris, C. (1990). *Overcoming organizational defences: Facilitating organizational learning.* Boston: Allyn and Bacon.

Argyris, C. (1991). Teaching smart people how to learn. In *Harvard Business Review, 60,* (3), 99-109.

Argyris, C. & Schön, D. A. (1974). *Theory in practice: Increasing professional effectiveness.* San Francisco: Jossey-Bass.

Argyris, C. & Schön, D. A. (1978). *Organizational learning: A theory of action perspective.* San Francisco: Jossey-Bass.

Baker, E. L. & O'Neil, H. F. (1987). Assessing instructional outcomes. In R. M. Gagné (Ed.), *Instructional technology: Foundations* (pp. 343-377). Hillsdale, N.J.: Lawrence Erlbaum Associates.

Banathy, B. H. (1987). Instructional systems design. In R. M. Gagné (Ed.), *Educational technology: Foundations* (pp. 85-112). Hillsdale, N.J.: Lawrence Erlbaum.

Bell, Ch. (1991). Using training aids. In J. Prior (Ed.), *Handbook for training and development* (pp. 439-467). Aldershot Hants: Gower.

Benjamin, S. (1989). A closer look at needs analysis and needs assessment: Whatever happened to the systems approach? *Performance & Instruction, 28* (9), 12-16.

Bennett, R. (1991). Developing effective trainers. In J. Prior (Ed.), *Gower handbook of training and development* (pp. 228-254). Aldershot Hants: Gower.

Bennis, W. G., Benne, K. D. & Chin, R. (Eds.), (1969). *The planning of change.* second edition. New York: Holt, Rinehart and Winston Inc.

Blank, W. E. (1982). *Handbook for developing competency-based training programs.* Englewood Cliffs: Prentice-Hall.

Block, P. (1981). *Flawless consulting: A guide to getting your expertise used.* San Diego, CA.: University Associates.

Bobbitt, F. (1918). *The curriculum.* Cambridge, Mass.: The Riverside Press. Reprinted in 1971 by Boston: Houghton Mifflin Company.

Boekaerts, M. & Simons, P. R. J. (1993). *Leren en instructie. Psychologie van de leerling en het leerproces* [Learning and instruction. Psychology of learners and the learning process]. Assen: Dekker & Van de Vegt.

Boekenoogen, M. S. & Stokking, K. M. (1991). *Methoden van behoeftenonderzoek* [Methods for needs assessment]. Utrecht: ISOR, University of Utrecht.

Boud, D. Keogh, R. & Walker, D. (1987). *Reflection: Turning experience into learning.* London: Kogan Page.

Branson, R. K. & Grow, G. (1987). Instructional systems development. In R. M. Gagné (Ed.), *Instructional technology: Foundations* (pp. 397-428). Hilsdale, N.J.: Lauwrence Erlbaum.

Branson, R. K., Rayner, G. T., Cox, J. L., Furman, J., King, F.J. & Hannum, W. H. (1975). *Interservice procedures for instructional systems development* (ADA 019 468). Center for Educational Technology, Florida State University.

Briggs, L. (1977). *Instructional design: Principles and applications.* Englewood Cliffs: Educational Technology Publications.

Brinkerhoff, R. O. (1988). *Achieving results from training.* San Francisco: Jossey Bass.

Broad, M. L. & Newstom, J. W. (1992). *Transfer of training. Action-packed strategies to ensure high payoff from training investments.* Reading, Mass: Addison-Wesley Publishing Company, Inc.

Bruner, J. S. (1966). *Toward a theory of instruction.* Cambridge: Harvard University Press.

Buckley, R. & Caple, J. (1990). *The theory and practice of training.* London: Kogan Page.

Carlisle, K. E. (1986). *Analyzing jobs and tasks.* Englewood Cliffs, N.J.: Educational Technology Publications.

Carnevale, A. P. (1991). *America and the new economy.* San Francisco: Jossey-Bass.

Carnevale, A. P. (1992). Learning: The critical technology. *Training and Development, 46,* (2) S1-16.

Carnevale, A. P., Gainer, L. J. & Meltzer, A. S. (1991). *Workplace basics. The essential skills employers want.* San Francisco: Jossey-Bass.

Carnevale, A. P. & Schulz, E. R. (1990). Return on Investment: Accounting for training. *Training & Development Journal, 7,* S1-32.

Carr, C. (1992). *Smart training. The manager's guide to training for improved performance.* New York: McGraw-Hill, Inc.

Chalofski, N. E. & Reinhart, C. (1988). *Effective human resource development.* San Francisco: Jossey-Bass.

Clark, N. (1991). *Managing personal learning and change. A trainer's guide.* London: McGraw-Hill.

Cook, Th. D. & Campbell, D. T. (1979). *Quasi-Experimentation. Design & analysis issues for field settings.* Chicago: Rand McNally College Publ.

Coopers & Lybrand Associates (1985). *A challenge to complacency: Changing attitudes to training.* Sheffield: Manpower Services Commission and National Economic Development Office, UK.

Craig, M. (1992). Techniques for investigation. Techniques for analysis. In S. Truelove (Ed.), *Handbook for training & development* (pp. 1-49). Oxford: Blackwell.

Cras, P. (1992). Toetsen van beroepskwalificaties [Testing vocational qualifications]. In J. W. M. Kessels & C. A. Smit (Eds.), *Opleiders in Organisaties, Capita Selecta* 10. Deventer: Kluwer Bedrijfswetenschappen.

Cummings, O. W. & Parks, L. W. (1991). Corporate education and training. In M. C. Alkin (Ed.), *Encyclopedia of educational research,* second edition. New York: Macmillan Publishing Company.

Dahl, H. L. (1987). Return on investment. In R. L. Graig (Ed.), *Training and development handbook* (pp. 343-348). New York: McGraw-Hill Book Company.

Davies, I. K. (1970). *The management of learning.* London: McGraw-Hill.

Davis, M., Gray, G. M. & Hallez, H (1990). *Manuals that work. A guide for writers.* London: Kogan Page.

Debenham, I. (1991). Management games and case studies. In J. Prior (Ed.), *Handbook of training and development* (pp. 651-667). Aldershot Hants: Gower.

DeLandsheere, V. (1991). Taxonomies of educational objectives. In A. Lewy (Ed.), *The international encyclopedia of curriculum* (pp. 317-326). Oxford: Pergamon.

Dennis, J. and Austin, B. (1992) A BASE(ic) course on job analysis, *Training & Development,* (7), 67-70.

Diamond, R. M. (1986). Systems approaches to instruction and development. In M. Eraut (Ed.), *The International encyclopedia of educational technology* (pp. 328-333). Oxford: Pergamon Press.

Dick, W. (1977). Formative evaluation. In L. J. Briggs (Ed.), *Instructional design: Principles and applications.* Englewood Cliffs, N.J.: Educational Technology Publications.

Douw, A. (1992). *Het ontwerpen van een nieuwe introductiecursus voor Rabobank Nederland. Het toetsen van een onderwijskundig model aan een praktijksituatie* [Designing an induction course for Rabobank Nederland. Field test of an ISD model]. Eindhoven: Rabobank Nederland/Technische Universiteit Eindhoven

Duke, R. (1983). Specifications for game design. In I. Stahl (Ed.), *Operational gaming: an international approach.* Oxford: Pergamon Press.

Duncan, J. B. & Powers, E. S. (1992). The politics of intervening in organizations. In H. D. Stolovitch & E. J. Keeps (Eds.), *Handbook of human performance technology* (pp. 77-93). San Francisco: Jossey Bass.

Eisner, E. W. (1985) *The art of educational evaluation. A personal view.* Philadelphia, PA: The Falmer Press.

Eisner, E. W. & Vallance, E. (1974). *Conflicting concepts of the curriculum.* National Society for the Study of Education Series on Contempory Educational Issues, Berkeley, CA: McCutchan.

Elen, J., Lowijck, J. & Branden J. van den (1991). *Ontwikkelen van schriftelijk studiemateriaal* [Developing instructional texts]. Leuven: ACCO.

Ellis, S. K. (1988). *How to survive a training assignment.* Reading, MA: Addison-Wesley.

Eurich, (1985). *Corporate classrooms. The learning business.* Princeton, NJ: Carnegy Foundation.

Evers, J. L. M. (1990). Succesvol invoeren van projectmanagement in een organisatie [Successful implementation of project management in organizations]. *M&O, Tijdschrift voor organisatiekunde en sociaal beleid,* 5, 474-485.

Faber, K. (1990). *Van leerstofklapper tot cursistenwerkboek* [Developing course material]. Deventer: Van Loghum Slaterus.

Feteris, A., Verhagen, P.W. & Plomp, Tj. (1992). Methodisch ontwerpen: een wetenschappelijke methode? [Methodical design: A scientific method?] In: Tj. Plomp, A. Feteris, J. M. Pieters & W. Tomic (Eds.), *Ontwerpen van onderwijs en trainingen* (pp. 301-324). Utrecht: Uitgeverij Lemma.

Field, L. & Drysdale, D. (1991). *Training for competence.* London: Kogan Page.

Flanagan, J. C. (1954). The critical incident technique. *Psychological Bulletin, 51,* (7), 327-358.

Fleming, M. & Levie, W.H. (1978). *Instructional message design. Principles from the behavioural sciences.* Englewood Cliffs, N.J.: Educational Technology Publications.

Foshay, W., Silber, K. & O. Westgaard, (1986). *Instructional design competencies. The standards,* University of Iowa - The International Board of Standards for Training, Performance and Instruction.

Frame, J. (1987). *Managing projects in organizations: How to make the best use of time, techniques, and people.* San Francisco: Jossey-Bass.

Fullan, M. (1982). *The meaning of educational change.* New York: Teachers College Press.

Fullan, M. (1986). Curriculum implementation. In M. Eraut (Ed.), *The international encyclopedia of educational technoloy* (pp. 485-491). Oxford: Pergamon Press.

Gael, S. (1988). *The job analysis handbook for business, industry and government.* Volume 1 and 2. New York: Wiley.

Gagné, R. M. (1973). *The conditions of learning.* London: Holt, Rinehart & Winston.

Gagné, R. M. & Glaser, R. (1987). Foundation in learning research. In R. M. Gagné (Ed.), *Instructional Technology: Foundations* (pp. 49-84). Hillsdale, N.J.: Lawrence Erlbaum.

Garrett, B. (1987). *The learning organization.* London: Fontana Collins.

Garving, D. (1993). Building a learning organization. In *Harvard Business Review, 71,* (4), 78-91.

Gay, G. (1986). Curriculum development. In M. Eraut (Ed.), *The international encyclopedia of educational technoloy* (pp. 467-476). Oxford: Pergamon Press.

Gilbert, T. (1978). *Human competence: Engineering worthy performance.* New York: McGraw-Hill.

Gilley, J. W. & Eggland, S.A. (1989). *Principles of human resource development.* Reading, Mass.: Addison-Wesley.

Goldstein, I. L. & Buxton, V. M. (1982). Training and human performance. In M. D. Dunnette & E. A. Fleishman (Eds.), *Human capability assessment* (pp. 135-178). Hillsdale, N.J.: Lawrence Erlbaum Associates.

Goodlad, J. I. (1960). Curriculum: The state of the field. *School Review 75* (3), 277-282.

Goodlad, J. I. (1984). *A place called school.* New York: McGraw-Hill.

Goodlad, J. I. (1985). Curriculum as a field of study. In T. Husén, & T. N. Postlethwaite (Eds.), International encyclopedia of education (pp. 1141-1144). Oxford: Pergamon.

Goodlad, J. I., Klein, M. F. & Tye, K. A. (1979). The domains of curriculum and their study. In J. L. Goodlad et al. (Eds.), *Curriculum inquiry: The study of curriculum practice* (pp. 43-76). New York: McGraw-Hill.

Goodlad, J. I. & Zhixin Su (1992). Organization of the curriculum. In Ph. W. Jackson (Ed.), *Handbook of research on curriculum* (pp. 327-344). New York: Macmillan Publishing Company - American Educational Research Association.

Grinwis, P. (1990). *Onbevangen ontmoeten. Adviseren bij besturen* [Uninhibited encounter. Consulting corporate boards]. Deventer: Kluwer Bedrijfswetenschappen.

Gropper, G. L. (1983). A metatheory of instruction. In C. M. Reigeluth (Ed.), *Instructional-design theories and models: An overview of their current status* (pp. 37-54). Hillsdale, N.J.: Lawrence Erlbaum.

Haarlem, F. H. M. van (1989). Opleiden bij informatisering: een uitdaging voor de opleidingskundige [Training in computer skills: a challenge to corporate educators]. In J. W. M. Kessels, C. A. Smit & F. H. M. van Haarlem (Eds.), *Opleiden en Informatisering. Handboek Opleiders in Organisaties Capita Selecta*, 1.
Deventer: Kluwer Bedrijfswetenschappen.

Hamblin, A. C. (1974). *Evaluation and control of training.* London: McGraw-Hill.

Harless, J.H. (1970). *One ounce of analysis is worth a pound of objectives.* Newnan, Ga.: Harless Performance Guild.

Harless, J.H., (1979). *Front-end analysis of soft skills training (FEAST).* Newnan, Ga.: Harless Performance Guild.

Harrison, R. (1988), *Training and Development.* London: Institute of Personnel Management.

Harrison, R. (1992), *Employee Development,* London: Institute of Personnel Management.

Hartley, J. & Davies, I. K. (1976). Preinstructional strategies: the role of pretexts, behavioural objectives, overviews and advance organizers. *Review of Educational Research, 46,* (2), 239-265.

Hawthorne, E. H. (1987). *Evaluating employee training programs. A research-based guide for human resource managers.* New York: Quorum Books.

Hennessy, D. & Hennessy, M. (1989). *Instructional systems development: Tools and procedures for organizing, budgetting, and managing a training project from start to finish.* Frederiksted, St. Croix: TRC Press.

Henschke, J. A. (1991). History of human resource developer competencies. In N. M. Dixon & J. Henkelman (Eds.) *The academic guide. Models for HRD practice* (pp. 9-30). Alexandria, VA: ASTD.

Hiebert, M. B. & Smallwood, W. N. (1990). Now for a completely different look at needs analysis. In E. L. Allen (Ed.), *Needs assessment instruments, ASTD trainer's toolkit* (pp. 229-233). ASTD-Pfeiffer & Company.

Holding, D. H. (1991). Transfer of training. In J. E. Morrison (Ed.), *Training for Performance* (pp. 93-125). Chichester: John Wiley & Sons.

Houben, W. Th. J. G. (1993). Curriculumtheorie en -technologie [Curriculum theory and technology]. In W. J. Nijhof, H. A. M. Franssen, W. Th. J. G. Hoeben & R. G. M. Wolbert (Eds.), *Handboek curriculum, modellen, theorieën, technologieën* (pp. 67-110). Amsterdam/Lisse: Swets & Zeitlinger.

Jackson, Ph. W. (1992). Conceptions of curriculum and curriculum specialists. In Ph. W. Jackson (Ed.), *Handbook of research on curriculum* (pp. 3-40). New York: Macmillan Publishing Company - American Educational Research Association.

Jackson, S. F. & Addison, R. M. (1992). Planning and managing projects. In H. D. Stolovitch & E. J. Keeps (Eds.), *Handbook of human performance technology* (pp. 66-76). San Francisco: Jossey-Bass.

Janes, S. T. (1984). Selecting trainees. In W. R. Tracey (Ed.), *Human resources management and development handbook* (pp. 1404-1412). New York: AMACOM.

Jarvis, P. (1987). *Adult learning in the social context.* London: Croom Helm.

Jarvis, P. (1992). *Paradoxes of learning.* San Francisco: Jossey-Bass.

Jong, J. A. de (1991). Werkplek-opleiden: hoe werkt dat? [On the job training: How does it work?]. In D. Kruijd, J. W. M. Kessels & C. A. Smit (Eds.), *Opleiden op de werkplek. Opleiders in Organisaties Capita Selecta 6.* Deventer: Kluwer Bedrijfswetenschappen.

Joyce, B. & Weil, M. (1980). *Models of teaching.* Englewood Cliffs, N.J.: Prentice Hall.

Kaufman, R. (1982). *Identifying and solving problems: a system approach.* San Diego: University Associates.

Kaufman, R. (1990). A needs assessment primer. In E. L. Allen (Ed.), *Needs assessment instruments. ASTD trainer's toolkit* (pp. 224-228). Alexandria, VA: ASTD-Pfeiffer & Company.

Kaufman, R., Stakenas, R. G. Wager, J. C. & Mayer, H. (1981). Relating needs assessment, program development, implementation, and evaluation. *Journal of Instructional Development, 4,* (4), 10-15.

Kaufman, R. & Thiagarajan, S. (1987). Identifying requirements and specifying for instruction. In R. M. Gagné (Ed.), *Instructional technology: Foundations* (pp. 113-140). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Kearsley, G. (1982). *Cost, benefits & productivity in training systems.* Reading, MA: Addison Wesley.

Kearsley, G. (1991). Training media and technology. In J. E. Morrison (Ed.), *Training for performance. Principles for applied human learning* (pp. 232-257). Chichester: John Wiley & Sons.

Kessels, J.W.M. (1986). Taakanalyses ten behoeve van functiegerichte opleidingen [Task analysis for job training]. In Tj. Plomp & J. G. L. Thijssen (Eds.), *Curriculumontwikkeling voor beroepsonderwijs en bedrijfsopleidingen* (pp. 45-57). Lisse: Swets & Zeitlinger.

Kessels, J. W. M. (1992). COCOS: Computer ondersteuning bij het ontwerpen van cursussen [COCOS: Computer assisted training design]. *Opleiding & Ontwikkeling, 4,* (7/8), pp. 45-47.

Kessels, J. W. M., (1992) *Towards design standards in corporate education,* Paper at ECER'92. Enschede: Twente University.

Kessels, J. W. M. & Smit, C. A. (1985). Het gebruik van theoretische modellen in de opleidingspraktijk [Use of theoretical models in the field of training]. In: *Training & Opleiding, 4,* (4), 4-10.

Kessels, J. W. M. & Smit, C. A. (1982). Organisatie-agogische taken met betrekking tot bedrijfsopleidingen [Planned change and corporate education]. In A. Cozijnsen & W. J. Vrakking (Eds.), *Inleiding in de organisatie-agologie* (pp. 189-201). Alphen aan de Rhijn: Samsom.

Kessels, J. W. M. & Smit, C. A. (1984). Opleidingen in Arbeidsorganisaties [Programmes for corporate education]. *Practisch Personeelsbeleid/Capita Selecta* 8, 1-26. Deventer: Kluwer.

Kessels, J. W. M. & Smit, C. A. (1989a). *Opleidingskunde. Een bedrijfsgerichte benadering van leerprocessen* [Corporate education. A business-led approach to learning processes]. Deventer: Kluwer Bedrijfswetenschappen.

Kessels, J. W. M. & Smit, C. A. (Eds.), (1989b). *Handboek opleiders in organisaties* [Handbook for corporate educators]. Deventer: Kluwer Bedrijfswetenschappen.

Kessels, J. W. M. & Smit, C. A. (1991). Opleidingsnoodzaak en evaluatie: op zoek naar vaardigheden [Training needs and evaluation: in search of skills]. In Th. Lamers, J. W. M. Kessels & C. A. Smit (Eds.), *Behoeftenbepaling, Capita Selecta 8* (pp. 100-117). Deventer: Kluwer Bedrijfswetenschappen.

Kessels, J. W. M. & Smit, C. A. (1991). *Omgaan met lastige groepen* [Dealing with difficult groups]. 's-Gravenhage: Delwel.

Kessels, J. W. M. & Smit, C. A. (1992). De hoogbegaafde organisatie: over het pad van de vijfde discipline en andere reisverhalen [The highly talented organization: along the path of the fifth discipline and other travel stories]. *Opleiding & Ontwikkeling, 4*, (7/8), 25-30.

Kessels, J. W. M. & Smit, C. A. (in press). Job analysis in corporate education. In T. Husén, T. N. Postlethwaite & Tj. Plomp (Eds.), *International encyclopedia of education,* 2nd edition. Oxford: Pergamon Press.

Keursten, P. (1992). Opleidingsevaluatie [Educational evaluation]. In J. W. M. Kessels & C. A. Smit (Eds.), *Opleiders in Organisaties, Capita Selecta, 12.* Deventer: Kluwer Bedrijfswetenschappen.

King, J. A., Morris, L. L. & Fitz-Gibbon, C. T. (1987). *How to assess program implementation.* Newburry Park: Sage Publications.

Kinlaw, D. C. (1989). *Coaching for commitment, managerial strategies for obtaining superior performance.* San Diego: University Associates.

Kirkpatrick, D. L. (1975). *Evaluating training programs.* A collection of articles from the Journal of the American Society for Training and Development. Madison, WI: ASTD.

Kirrane, D. E. (1986). Cost accounting today. *Training & Development Journal,* (9), 24-27.

Kirwan, B. & Ainsworth, L. K. (1992). *A guide to task analysis.* London: Taylor & Francis.

Klein, M. F. (1991). A conceptual framework for curriculum decision-making. In M. F. Klein (Ed.), *The politics of curriculum decision-making.* (pp. 24-41). Albany, NY: State University of New York Press.

Knowles, M. (1990). *The adult learner. A neglected species.* Houston, TX: Gulf Publishing Company.

Kolb, D. (1984). *Experiential Learning.* New York: Prentice Hall.

Kooten, T. van (1993). Vingeroefeningen bij de bepaling van trainingsrendement [Finger exercises for assessing training benefit]. In *Opleiding & Ontwikkeling*, 6, 3-6.

Kruijd, D. (1992). Opleiden op de werkplek [On-the-job training]. In J. W. M. Kessels & C. A. Smit (Eds.), *Opleiders in Organisaties/Capita Selecta,* 6. Deventer: Kluwer Bedrijfswetenschappen.

Kruijd, D., Luiken, V. T. M. & Meer, M. M. van der (1989). *Handleiding proces (her)ontwikkeling van opleidingen* [Manual for (re)developing training programmes]. Utrecht, N.V. Nederlandse Spoorwegen.

Lamers, Th. & Thijssen, J. G. L. (1992). Het bepalen van opleidingsbehoeften in organisaties [Training needs assessment in organizations]. In Th. Lamers, J. W. M. Kessels & C. A. Smit (Eds.), *Behoeftenbepaling, Opleiders in Organisaties, Capita Selecta*, 8. Deventer: Kluwer Bedrijfswetenschappen.

Latham, G. P. & Crandall, S.R. (1991). Organizational and social factors. In J. E. Morrison (Ed.), *Training for performance* (pp. 260-285). Chichester: John Wiley & Sons.

Lintern, G. (1991). Instructional strategies. In J. E. Morrison (Ed.), *Training for performance* (pp. 167-192). Chichester: John Wiley & Sons.

Lippitt, G. & Lippitt, R. (1986). *The consulting process in action.* San Diego: University Associates.

Lippitt, R., Watson. J. & Westley, B. (1958). *The dynamics of planned change.* New York: Holt, Rinehart and Winston Inc.

Lowijck, J. (1991). The field of instructional design. In J. Lowyck, P. De Potter & J. Elen (Eds.), *Instructional design: Implementation issues* (pp.1-30). Procedings of the I.B.M./K.U.Leuven Conference, La Hulpe December 17-19,1991.

McCormick, E. J. (1979). *Job analysis: Methods and applications.* New York: AMACOM.

MacDonald-Ross, M. (1973). Behavioural objectives: a critical review. *Instructional Science,* 2. Amsterdam: Elsevier.

McLagan, P. A. (1983). *Models for Excellence.* Washington: ASTD.

McLagan, P. A. (1989). *The Models. Models for HRD practice.* Alexandria, VA: ASTD.

Mclagan, P. A. (1991). The learning organization made plain: An interview with Peter Senge. *Training and Development 45*, 10, 37-44.

Madaus, G.F. & Kellaghan, Th. (1992). Curriculum evaluation and assessment. In Ph. W. Jackson (Ed.), *Handbook of research on curriculum* (pp. 119-153). New York: Macmillan Publishing Company - American Educational Research Association.

Mager, R. F. (1962). *Preparing instructional objectives.* Palo Alto, CA: Fearon.

Mager, R. F. (1972). *Goal analysis.* Belmont, CA: Fearon-Pitman.

Mager, R. F. & Pipe, P. (1984). *Analyzing performance problems.* Belmont, CA: Pitman Learning.

Marsick, V. J. (Ed.), (1987). *Learning in the workplace.* London: Croom Helm.

Marsick, V. J. & Watkins, K. (1990). *Informal and incidental learning in the workplace.* London: Routledge.

Merrill, P. F. (1987). Job and task analysis. In R. M. Gagné (Ed.), *Instructional technology: Foundations* (pp. 141-174). Hillsdale, N.J.: Lawrence Erlbaum Associates.

Merrill, M. D., Reigeluth, C. M. & Faust, G. F. (1979). The instructional quality profile: A curriculum evaluation and design tool. In H. F. O'Neil (Ed.), *Procedures for instructional systems development* (pp. 165-204). New York: Academic Press.

Meyer, H. L. (1978). *Trainingsprogramm zur Lernzielanalyse.* Kronberg: Athenäum-Verlag.

Miles, M. B. & Huberman, A. M. (1984). *Qualitative data analysis.* London: Sage.

Mills, G. M., Pace, R. W. & Peterson, B. D. (1988). *Analysis in human resource training and organization development.* Reading, Mass.: Addison-Wesley Publishing Company, Inc.

Moorby, E. (1991). Mentoring and coaching. In J. Prior (Ed.), *Gower handbook of training and development* (pp. 421-438). Aldershot Hants: Gower.

Morris, L. L, Fitz-Gibbon, C. T. & Lindheim, E. (1987). *How to measure performance and use tests.* Newbury Park: Sage Publications.

Mulder, M. (1988). Kosteneffectiviteit van bedrijfsopleidingen [Cost effectiveness of corporate education]. In J. J. Peters (Ed.), *Gids voor de opleidingspraktijk: visies, modellen en technieken* (pp. 1-22). Deventer: Van Loghum Slaterus.

Mulder, M. & Pieters, J.M., (1992). Ontwerpen in de onderwijskunde [Design in educational technology] . In Tj. Plomp, A. Feteris, J. M. Pieters, & W. Tomic (Eds.), *Ontwerpen van onderwijs en trainingen* (pp. 39-63). Utrecht: Lemma.

Mumford, A. (1984). The role of the boss in helping subordinates to learn. In B. Taylor & G. Lippitt (Eds.), *Management development and training handbook* (pp. 351-353). London: McGraw Hill.

Munson, L. S. (1992). *How to conduct training seminars.* New York: McGraw-Hill.

Nadler, L. (1980). *Corporate human resource development. A managment tool.* New York: Van Nostrand Reinhold/ASTD.

Nadler, L. (1982). *Designing training programs. The critical events model.* Reading, MA: Addison Wesley.

Nadler, L. (1984). *The handbook of human resource development.* New York: Wiley & Sons.

Nadler, L. & Nadler, Z. (1989). *Developing human resources.* third edition. San Francisco: Jossey-Bass.

Nadler, L. & Nadler, Z. (1992). *Every manager's guide to human resource development.* San Francisco: Jossey-Bass.

Nadler, L. & Wiggs, G. D. (1989). *Managing human resource development.* San Francisco: Jossey-Bass.

Nathans, H. (1992). *Adviseren als tweede beroep. Resultaat bereiken als adviseur* [Consulting as a second profession. Achieving results as a consultant]. Deventer: Kluwer Bedrijfswetenschappen.

Newstrom, J. W. & Lilyquist, J. M. (1990). Selecting needs analysis methods, In E. L. Allen (Ed.), *Needs assessment instruments. ASTD trainer's toolkit* (pp. 234-237). ASTD-Pfeiffer & Company.

Norton, R. E. (1985). *DACUM Handbook.* The National Center for Research in Vocational Education. OHIO State University, Columbus, Ohio.

Nijhof, W. (1983). *Over het ontwerpen van curricula* [Designing curricula]. inaugural lecture. Enschede: University of Twente.

Nijhof, W. (1993a). Inleiding en rationale [Introduction and rationale]. In W. Nijhof, H. A. M. Franssen, W. Th. J. Hoeben & R. G. M. Wolbert (Eds.), *Handboek curriculum, modellen, theorieën, technologieën* (pp. 13-31). Amsterdam/Lisse: Swets & Zeitlinger.

Nijhof, W. (1993b). Het ontwerpen van onderwijsleerpakketten [Designing instructional packages]. In W. Nijhof, H. A. M. Franssen, W. Th. J. Hoeben & R. G. M. Wolbert (Eds.), *Handboek curriculum, modellen, theorieën, technologieën* (pp. 297-332). Amsterdam/Lisse: Swets & Zeitlinger.

Nijhof, W. J., Mulder, M. & Van Wijk, M. (1992). *Cost indicators for developing corporate training.* St. Paul, MN: University of Minnesota - Training and Development Center.

Noort, R. van (1992). *Bomen over beslissen* [A flow chart on decision-making in training]. Unpublished report. University of Amsterdam: Department of Education.

Ouden, M. A. den (1992). *Transfer na bedrijfsopleidingen* [Transfer after corporate education]. dissertation, Utrecht: Rijks Universiteit.

Patrick, J. (1991). Types of analysis for training, In: J. E. Morrison (Ed.), *Training for performance* (pp. 127-166). Chichester: John Wiley & Sons.

Patrick, J. (1992). *Training: Research and practice*, London: Academic Press.

Pedler, M., Burgyogne, J. & Boydell, T. (1991). *The learning company. A strategy for sustainable development.* London: McGraw-Hill.

Peterson, R. (1992). *Training needs analysis in the workplace,* London: Kogan Page.

Phillips, J. J. (1983). *Handbook of training evaluation and measurement methods.* Houston, TX: Gulf.

Phillips, K. & Shaw, P. (1989). *A consultancy approach for trainers.* Aldershot Hants: Gower Publishing Company.

Pieters, J. M. (1991). Approaches to and uses of needs analysis: Who is asking questions? In J. Lowyck, P. De Potter, & J. Elen (Eds.), *Instructional design: Implementation issues* (pp. 43-68). Procedings of the I.B.M./K.U.Leuven Conference, La Hulpe December 17-19,1991.

Pieters, J. M. (1992a). *Het ongekende talent* [The unprecedented talent]. inaugural lecture. Enschede: Universiteit Twente.

Pieters, J. M. (1992b). Behoeftenanalyse [Needs analysis]. In Tj. Plomp, A. Feteris, J. M. Pieters, & W. Tomic (Eds.), *Ontwerpen van onderwijs en trainingen* (pp. 145-160). Utrecht: Lemma.

Pieters, J. M. & Mulder, M. (1992). Van vooronderzoek naar prototype en product [From preliminary inquiry to prototype and product]. In Tj. Plomp, A. Feteris, J. M. Pieters, & W. Tomic (Eds.), *Ontwerpen van onderwijs en trainingen* (pp. 221-235). Utrecht: Lemma.

Pilot, A., Van Hout Wolters, B. & Kramers Pals, H. (1983). *Schriftelijk studiemateriaal* [The development of reading materials]. Utrecht: Het Spectrum.

Plomp, Tj. (1982). *Onderwijskundige technologie: enige verkenningen* [Exploring educational technology]. Inaugural lecture, Enschede: Universiteit Twente TO.

Plomp, Tj. (1986). De computer in het curriculum [The computer in the curriculum]. *Nederlands Tijdschrift voor Opvoeding, Vorming en Onderwijs, 2,* (3), 129-141.

Plomp, Tj. (1992). Onderwijskundig ontwerpen: een inleiding [Introduction to educational design]. In Tj. Plomp, A. Feteris, J. M. Pieters, & W. Tomic (Eds.), *Ontwerpen van onderwijs en trainingen* (pp. 19-38). Utrecht: Lemma.

Pont, T. (1991). *Developing effective training skills.* London: McGraw-Hill.

Potter, P. de, (1991). A systems approach to education. In J. Lowijck, P. De Potter & J. Elen (Eds.), *Instructional design: Implementation issues* (pp. 31-41). Procedings of the I.B.M./K.U.Leuven Conference, La Hulpe December 17-19,1991.

Rae, L. (1986). *How to measure training effectivenss.* Aldershot Hants: Gower.

Rae, L. (1992). Job training needs. In J. Prior (Ed.), *Gower handbook of training and developement* (pp.193-211). Aldershot Hants: Gower.

Reigeluth, C. M. (1983). Instructional design: What is it and why is it In C. M. Reigeluth (Ed.), *Instructional-design theories and models: An overview of their current status* (pp. 4-31). Hillsdale NJ: Lawrence Erlbaum.

Reigeluth, C. M. (Ed.), (1987). *Instructional theories in action. Lessons illustrating selected theories and models.* Hillsdale NJ: Lawrence Erlbaum.

Reigeluth, C. M. & Curtis, R. V. (1987). Learning situations and instructional models. In R. M. Gagné (Ed.), *Instructional technology: Foundations* (pp. 175-206). Hillsdale, N.J.: Lawrence Erlbaum Associates.

Reiser, R. A. (1987). Instructional technology: A history. In R. M. Gagné (Ed.), *Instructional technology: Foundations* (pp. 11-48). Hillsdale, N.J.: Lawrence Erlbaum Associates.

Reiser, R. A. & Gagné, R. M. (1983). *Selecting media for instruction.* Englewood Cliffs, N.J.: Educational Technology Publications.

Rijkers, A. A. M. (1991). *De kern van de zaak. Praktijkboek voor opleiders* [At the core of the profession. Handbook for the training practice]. Schoonhoven: Academic Service.

Robinson, D. G. & Robinson, J. (1989). *Training for impact.* San Francisco: Jossey-Bass.

Romiszowski, A. J. (1981). *Designing instructional systems.* London: Kogan Page.

Romiszowski, A. J. (1984). *Producing instructional systems.* London: Kogan Page.

Romiszowski, A. J. (1988). *The selection and use of instructional media.* London: Kogan Page.

Romiszowski, A. J. (1990). Trends in corporate training and development. In M. Mulder, A. J. Romiszowski & P. C. van der Sijde (Eds.), *Strategic human resource development* (pp. 17-48). Amsterdam: Swets & Zeitlinger.

Roozemond, C. (1987). *Opleidingsbeleidsplan van de technische vakopleidingen voor Fokker Aircraft B.V.* [Educational policy for technical training at Fokker Aircraft BV]. Amsterdam: Fokker.

Rosenberg, M. J., Coscarelli, W. C. & Hutchison, C. S. (1992). The origins and evolution of the field. In H. D. Stolovitch & E. J. Keeps (Eds.), *Handbook of human performance technology* (pp. 14-31). San Francisco: Jossey-Bass.

Rossett, A. (1987). *Training needs assessment.* Englewood Cliffs, NJ: Educational Technology Publications.

Rossett, A. (1992). Analysis of human performance problems, In H. D. Stolovitch & E. J. Keeps (Eds.), *Handbook of human performance technology* (pp. 97-113). San Francisco: Jossey-Bass.

Rossett, A. & Gautier-Downes, J. (1991). *A handbook of job aids.* San Diego: Pfeiffer & Company.

Rothwell, W. J. & Kazanas, H. C. (1992). *Mastering the instructional design process. A systematic approach.* San Francisco: Jossey-Bass.

Roscoe, J. (1992). Analysis of organizational training needs. In S. Truelove (Ed.), *Handbook of training & development* (pp. 50-79). Oxford: Blackwell.

Rowntree, D. (1974). *Educational technology in curriculum development.* London: Harper & Row.

Rowntree, D. (1990). *Teaching through self-instruction. How to develop open learning materials.* London: Kogan Page.

Sanderson, G. (1992). Objectives and evaluation. In S. Truelove (Ed.) *Handbook of training & development* (pp. 114-142). Oxford: Blackwell.

Schein, E. H. (1985). *Organizational culture and leadership.* San Francisco: Jossey-Bass.

Schendel, J. D. & Hagman, J. D. (1992). Long-term retention of motor skills. In J. E. Morrison (Ed.), *Training for performance* (pp. 53-92). Chichester: John Wiley & Sons.

Schiffman, S. S. (1986). Instructional systems design. Five views of the field. *Journal of Instructional Development, 3*, 14-19.

Schön, D. A. (1987). *Educating the reflective practitioner.* San Francisco: Jossey-Bass.

Schrag, F. (1992). Conceptions of knowledge. In Ph. W. Jackson (Ed.), *Handbook of research on curriculum* (pp. 268-301). New York: Macmillan Publishing Company - American Educational Research Association.

Schramade, P. W. J. (1989). Voorbereiding en planning van de effectevaluatie [Preparation and planning of effect evaluation]. In J. W. M. Kessels & C. A. Smit (Eds.), *Handboek Opleiders in Organsiaties* (pp. 178- 229). Deventer: Kluwer Bedrijfswetenschappen.

Schrijvers, J. & Rosendaal, B. (1990). Het ontwerpen van opleidingen: methodiek en technologische ondersteuning [Designing educational programmes: methods and technological assistence]. In J. J. Peters, P. Schramade, J. G. L. Thijssen, & R. van Ommeren (Eds.), *Gids voor de Opleidingspraktijk* (pp. 5.35 1-19). Houten: Van Loghum Slaterus.

Schulz, R. E. (1979). Computer aids for developing tests and instruction. In H. F. O'Neil (Ed.), *Procedures for instructional systems development* (pp. 39-66). New York: Academic Press.

Scriven, M. (1967). The methodology of evaluation. In. R. Tyler, R. M. Gagné & M. Scriven (Eds.), *Perspectives of curriculum evaluation.* AERA Monograph Series on Curriculum Evaluation, No.1. Chicago: Rand McNally.

Seashore, S. E., Lawler III, E. E., Mirvis, Ph. H. & Cammann, C. (1983). *Assessing organizational change. A guide to methods, measures and practices.* New York: Wiley & Sons.

Senge, P. (1990). *The fifth discipline: The art and practice of the learning organization.* New York: Doubleday Currency.

Shelton, S. & Allinger, G. (1993). Who's afraid of level 4 evaluation? A practical approach. *Training & Development,* 6, 43-46.

Silberman, M. & Auerbach, C. (1990). *Active training. A handbook of techniques, designs, case examples, and tips.* San Diego, CA.: University Associates.

Simons, P. R. J. (1990). *Transfervermogen* [Transfer ability]. Inaugural lecture. Nijmegen: Katholieke Universiteit Nijmegen.

Simons, P. R. J. (1992). De toepassing van transferbevorderende maatregelen in arbeidsorganisaties [Application of procedures conducive to transfer in companies]. *Tijdschrift voor Onderwijsresearch, 17,* (1), 28-39.

Sink, D. L. (1992). Success strategies for the human performance technologist. In H. D. Stolovitch & E. J. Keeps (Eds.), *Handbook of human performance technology* (pp. 564-575). San Francisco: Jossey-Bass.

Smit, C. A. (1992). De expert als adviseur [The expert as consultant]. In: *Opleiding en Ontwikkeling, 4,* (9), 29-32.

Snyder, B. R. (1973). *The hidden curriculum.* Cambridge, MA: MIT-Press.

Snyder, J., Bolin, F., & Zumwalt, K. (1992). Curriculum implementation. In Ph. W. Jackson (Ed.), *Handbook of research on curriculum,* (pp.402-435). New York: Macmillan Publishing Company - American Educational Research Association.

Spencer, L. M. (1986). *Calculating human resource costs and benefits: Cutting costs and improving productivity.* New York: Wiley.

Spitholt, W. E. (1992). *Effectiviteit van bedrijfsopleidingen* [Effective corporate education]. Enschede: Universiteit Twente.

Sprinthall, R. C., Schmutte, G. T. & Sirois, L. (1991). *Understanding educational research.* Englewood Cliffs, NJ: Prentice Hall.

Stake, R. E. (1973). The countenance of educational evaluation. In B. R. Worthen & J. R. Sanders (Eds.), *Educational evaluation: Theory and practice. Frameworks for planning evaluation studies* (pp.106-124). Belmont: Wadsworth Publishing Co.

Stokking, K. M. (1984). *Interpreteren en evalueren. Methodologie rondom de uitkomsten van onderzoek* [Interpretation and evaluation. Methodology for research findings]. Deventer: Van Loghum Slaterus.

Stolovitch H. D. & Keeps, E.J. (1992). What is human performance technology? Human performance interventions of an instructional nature. In H. D. Stolovitch & E. J. Keeps (Eds.), *Handbook of human performance technology* (pp. 3-13/381-382). San Francisco: Jossey-Bass.

Storey, J. (1992). *Developments in the management of human resources.* Oxford: Blackwell.

Stufflebeam, D. L. (1971). *Educational evaluation and decision making.* Itasca, Ill.: Peacock.

Stufflebeam, D. L. (1973). Educational evaluation and decision-making. In B. R. Worthen & J. R. Sanders (Eds.), *Educational evaluation: Theory and practice. Frameworks for planning evaluation studies* (pp.128-150). Belmont: Wadsworth Publishing Co.

Swanson, R. A. & Gradous, D. (1986). *Performance at work, a systematic program for analyzing work behavior.* New York: John Wiley & Sons.

Swanson, R. A. & Gradous, D. (1990). *Forecasting financial benefits of human resource development.* San Francisco: Jossey-Bass.

Swieringa, Wierdsma, (1989). *Op weg naar een lerende organisatie* [Becoming a learning organization]. Groningen: Wolters-Noordhoff.

Taba, H. (1962). *Curriculum development: Theory and practice.* New York: Harcourt, Brace & World.

Thijssen, J. G. L. (1988). *Bedrijfsopleidingen als werkterrein* [The field of corporate education]. Den Haag: Vuga/ROI.

Thijssen, J. G. L. (1989). Het bijstellen van een opleiding. Aanpak voor een formatieve evaluatie [Revising educational programmes. An approach to formative evaluation]. In J. W. M. Kessels & C. A. Smit (Eds.), *Handboek opleiders in organsiaties* (pp. 507-526). Deventer: Kluwer Bedrijfswetenschappen.

Tillema, H. (1993). Assessment en opleiden in organisaties [Assessment and training in organizations]. In J. W. M. Kessels & C. A. Smit (Eds.), *Opleiders in Organisaties, Capita Selecta*, 14. Deventer: Kluwer Bedrijfswetenschappen.

Tosti, D. & Jackson, S. F. (1992). Influencing others to act. In H. D. Stolovitch & E. J. Keeps (Eds.), *Handbook of human performance technology* (pp. 551-563). San Francisco: Jossey-Bass.

Tracey, W. R. (1971). *Designing training and development systems.* New York: American Management Association, Inc.

Tracey, W. R. (1981). *Human resource development standards.* New York: American Management Association.

Tracey, W. R. (1984). *Designing training and development systems* (revised edition). New York: American Management Association, Inc.

Tracey, W. R. (1991). *The human resource glossary.* New York: American Management Association.

Truelove, S. (1992). Tutor-delivered training. In S. Truelove (Ed.) *Handbook of training & development* (pp. 172-196). Oxford: Blackwell.

Vandenberghe, R. & Van der Vegt, R. (1992). *Scholen in de vernieuwingsarena* [Schools in the innovation arena]. Leuven: Garant.

Vásquez-Abad, J. & Winer, L. R. (1992). Emerging trends in instructional interventions. In H. D. Stolovitch & E. J. Keeps (Eds.), *Handbook of human performance technology* (pp. 672-687). San Francisco: Jossey-Bass.

Veen, G. van der, (Ed.) (1985). *Leerteksten kiezen, schrijven, vormen en drukken* [Selecting, writing, editing, and printing course material]. Utrecht: University of Utrecht, Kluwer, Van Loghum Slaterus.

Veersma, R. J. H. (1991). *S.O.M. Systematische opleidingsontwikkelings methode voor GAK-opleidingen* [S.O.M. ISD model for GAK Training]. Amsterdam: GAK.

Vegt, R. van der (1974). *Opleiden en evalueren. Een veldexperimentele studie naar uitkomsten van een bedrijfsopleiding* [Training and evaluation. A field study on the results of a corporate training programme]. Meppel: Boom.

Verhoeven, W. (1993). *De manager als coach* [The manager as coach]. Baarn: Nelissen.

Versloot, A. M. (1991). Werkplek-opleidingen sociologisch en organisatietheoretisch beschouwd [On-the-job training from a sociological and organization-theory perspective]. In D. Kruijd, J. W. M. Kessels & C. A. Smit (Eds.), *Opleiden op de werkplek. Opleiders in Organisaties Capita Selecta 6.* Deventer: Kluwer Bedrijfswetenschappen.

Volmac Top-Training (1990). *Volmac opleidingsontwikkelmodel* [Volmac's ISD-model].Utrecht: Volmac.

Vrakking, W. J. & Cozijnsen, A. J. (in press). *De organisatie-adviseur: van junior- tot topconsultant* [The consultant: from junior to the top].

Warshauer, S. (1988). *Inside training and development. Creating effective programs.* San Diego: University Associates.

Wart, M. Van, Cayer, N. J. & Cook, S. (1993). *Handbook of training and development for the public sector.* San Francisco: Jossey Bass.

Watkins, K. E. & Willis, V. J. (1991). Theoretical foundations of models for HRD practice. A critique. In N. M. Dixon & J. Henkelman (Eds.), *The academic guide. Models for HRD practice* (pp. 89-106). Alexandria, VA: ASTD.

Wexley, K. N. (1984). Personnel training. In *Annual Review of Psychology, 35*, 519-551.

Wiersma, W. (1991). *Research methods in education: An introduction.* Boston, MA: Allyn and Bacon.

Wierst, P. W. M. van & Geurts, J. L. A. (1991). Spelsimulatie in management-opleidingen [Gaming in management training]. In J. W. M. Kessels & C. A. Smit (Eds.), *Opleiders in Organisatie/Capita Selecta,* 7. Deventer: Kluwer Bedrijfswetenschappen.

Wolde, J. van de, (1992). Het algemeen model voor systematische probleemaanpak [A generic model for systematic problem solving]. In Tj. Plomp, A. Feteris, J. M. Pieters, & W. Tomic (Eds.), *Ontwerpen van onderwijs en trainingen* (pp. 65-85). Utrecht: Lemma.

Wijnen, G., Renes, W. & Storm, P. (1988). *Projectmatig werken* [Working with projects]. Utrecht: Het Spectrum.

Yin, R. K. (1989). *Case study research. Design and methods.* London: Sage.

Yin, R. K. (1991). The case study methods as a tool for doing evaluation. Draft version to appear in *Current Sociology.*

Zee, H. van der (1993). *Van opleiden tot ontwikkelen. Het perspectief van een lerende onderneming* [From training to development. The perspective of a learning enterprise]. Deventer: Kluwer Bedrijfswetenschappen.

Zemke, R. & Kramlinger, Th. (1982). *Figuring things out: A trainer's guide to needs and task analysis.* Reading, MA: Addison-Wesley.

TOWARDS DESIGN STANDARDS FOR CURRICULUM CONSISTENCY IN CORPORATE EDUCATION

Joseph Kessels

LIST OF APPENDICES

APPENDIX I: DATA COLLECTION PROTOCOL (CASES)

Data Collection Protocol CODE:

Naam van de Onderzoeker:

A.I. Administratieve gegevens:
(in te vullen door de contactpersoon)

1. Naam van de opleiding:

2. Naam en adres van de organisatie:

3. Naam Contactpersoon:
telefoonnumer:

A.II. Onderzoeksaktiviteiten;

1. Beschikbaar stellen van de volgende documenten (voorzover aanwezig):

1.1. Opdrachtformulering:
1.2. Hoofddoelen van de opleiding:
1.3. Taakanalyseverslag:
1.4. Leerdoelen:
1.5. Evaluatiemateriaal:
- 1.5.1. t.b.v. het reactieniveau:
- 1.5.2. t.b.v. de leerresultaten (toetsen):
- 1.5.3. t.b.v. het werkgedrag (praktijktoetsen, verslagen van chefs en cursisten):
- 1.5.4. t.b.v. het organisatiegedrag (div. onderzoeksmateriaal):

1.6. Lesmateriaal:
- 1.6.1. opleidingsplan (rooster-lessencyclus)
- 1.6.2. leerstofomschrijving
- 1.6.3. oefeningen, cases, rollenspelen, simulaties, practica enz.
- 1.6.4. opdrachten, praktijkopdrachten, zelfstudie enz.
- 1.6.5. omschrijving van leer- en hulpmiddelen

1.7. aanwijzingen bij het gebruik van het lesmateriaal
- 1.7.1. handleiding voor de docent
- 1.7.2. handleiding voor de praktijkbegeleider/mentor/coach/chef:

1.8. Betrokken docenten, gastdocenten, mentoren, coaches, chef, hoger management:
1.9. Kosten/baten analyse:

2. Afspraken maken ten behoeve van de volgende interviews.

2.1. opdrachtgever:

2.2. ontwikkelaar(s):

2.3. docent(en):

2.4. chef(s) van de cursisten:

2.5. enkele cursisten:

Voor elk interview wordt maximaal een uur uitgetrokken.
Indien er per categorie meerdere personen voor een interview in aanmerking komen, wordt hieruit in overleg met de onderzoeker at random een kleine groep samengesteld.

Profiel van de case.
(in te vullen door de contactpersoon)

1. Hoofddoel van de Opleiding:
Aan het eind van de opleiding is de cursist in staat om:

2. Succesvol/Niet succesvol
Korte samenvatting van de argumenten van de aanmelder.
Deze opleiding is succesvol/niet succesvol omdat:

Kenmerken van de opleiding:

3. Het hoofddoel van de opleiding richt zich op: *
3.1. management-vaardigheden
3.2. sociale vaardigheden
3.3. technische vaardigheden (wel/geen specifieke funktie)
3.4. informatica gebruikers vaardigheden (wel/geen specifieke funktie)
3.5. commerciele vaardigheden (wel/geen specifieke funktie)
3.6. Taalvaardigheden: (omschrijving taal of toepassing)
4. Hoofdvorm van de opleiding:
4.1. Extern
4.2. Intern
4.3. Incompany Intern/Extern
4.4. klassikaal
4.5. individueel
4.6. praktijkperiodes (opdrachten op de werkplek)
4.7. andere kenmerkende vorm:
*) aankruisen wat van toepassing is.

5. Omvang van de opleiding
5.1. Duur: dagen

5.2. Deelnemers: aantal per opleiding

5.3. Frequentie: aantal startmomenten per jaar

5.4. Verwachte levensduur: jaren

5.5. Aantal cursistenmensdagen per uitvoering:

5.6. Aantal cursistenmensdagen per jaar:

5.7. Aantal cursistenmensdagen in de verwachte levensduur:

B. Handleiding bij de Documentenstudie.

1.1. Opdrachtformulering:

1.1.1. Is er een geschreven opdrachtformulering?
1.1.2. Wordt in de opdrachtformulering een probleem omschreven dat met behulp van opleidingen opgelost dient te worden?
Wat is dat probleem?

1.1.3. Kan de oplossing van dat probleem d.m.v. leerprocessen bereikt worden? (opleidingsnoodzaak: gebrek aan vaardigheden, leerbaarheid van die vaardigheden, dispositie, motivatie)

1.1.4. Zijn er alternatieve oplossingen voor het probleem overwogen? Zo ja welke?

1.1.5. Maakt de opdracht tot een opleiding deel uit van een omvangrijker probleemaanpak? (organisatie-verandering, verbetering hulpmiddelen, naslagwerk, herstrukturering van bevoegdheden, taakverijking, ondersteunende vorm van leidinggeven. Zie Romiszowski, 1984; Kessels en Smit, 1989)
Zo ja, welke ?

1.1.6. Hoe luidt de opdracht?

1.1.7. Ligt er een discrepantie tussen het (vermoedelijke) probleem en de opdrachtformulering?
Omschrijf de discrepantie:

1.2. Hoofddoelen van de opleiding:

1.2.1. Zijn er hoofddoelen geformuleerd?
Zo ja, welke?

1.2.2. Liggen deze hoofddoelen in het verlengde van de opdrachtformulering?
Zo ja, wat is de logische verbinding?
Zo nee, wat is de discrepantie?

1.2.3. Kunnen deze hoofddoelen door middel van opleidingen gerealiseerd worden? Geef argumenten voor of tegen.

1.3. Taakanalyseverslag:

1.3.1. Is er een taakanalyseverslag?

1.3.2. Is te achterhalen welke analysemethoden toegepast zijn? Welke?

1.3.3. Waren deze analysemethoden geschikt voor een nadere uitwerking van de opdrachtformulering en de hoofddoelen?

1.3.4. Heeft er een oriëntatie op de werkplek plaatsgevonden?

1.3.5. Zijn belanghebbenden (chefs, ervaren medewerkers en potentiële cursisten) bij de analyse betrokken?

1.3.6. Wat heeft de taakanalyse toegevoegd aan de probleemstelling, opdrachtformulering en hoofddoelen?

1.4. Leerdoelen:

1.4.1. Zijn er leerdoelen? (een nadere uitwerking van de hoofddoelen) Hoeveel ?

1.4.2. Zijn de leerdoelen overwegend geformuleerd in termen van:
Kennis, weten, inzicht, begrip:

of vaardigheden:

1.4.3. Maak een percentuele indeling van de leerdoelen:

naar aard:	
cognitief	% (procedureel en probleemoplossing)
psychomotorisch	% (hoofd-hand-coordinatie)
interactief	% (sociale vaardigheden)
reactief	% (houdingsaspekten)
Totaal	100 %

1.4.4. Maak een percentuele indeling naar produktief en reproduktief:

produktief	%
reproduktief	%
Totaal	100 %

1.4.5. Liggen deze leerdoelen in het verlengde van de probleemstelling, de opdrachtformulering, de hoofddoelen en het taakanalysemateriaal?
(B.v. probleemstelling: gebrek aan vaardigheden, dan ook opdrachtformulering: gericht op vaardigheden
hoofddoel: in termen van vaardigheden
taakanalyse: gericht op de analyse van vaardigheden
leerdoelen: uitwerking in termen van vaardigheden.)

1.4.6. Zo nee, welke discrepanties zijn er waar te nemen?

1.5. Evaluatiemateriaal:

1.5.1. Is er evaluatiemateriaal t.b.v. het reactieniveau:

1.5.1.1. Welke aspekten van de opleiding worden positief beleefd?
door cursisten:
door chefs:

1.5.1.2. Welke aspekten van de opleiding worden negatief beleefd?
door cursisten:
door chefs:

1.5.2. Is er evaluatiemateriaal t.b.v. de leerresultaten (toetsen):

1.5.2.1. Liggen de toetsen in het verlengde van de leerdoelen?
- gericht op kennis of op vaardigheden (zie 1.4.2.)
- passend bij de soort doelen (zie 1.4.3.)
- passend bij het produktieve en reproduktieve karakter (zie 1.4.4.)

1.5.2.2. Zijn de toetsresultaten gunstig (75% scoort 75% van de items)

1.5.2.3. Zijn de toetsresultaten ongunstig (50% scoort 75% van de items)

1.5.3. Is er evaluatiemateriaal t.b.v. het werkgedrag (praktijktoetsen, verslagen van chefs en cursisten)?

1.5.3.1. Ligt dit evaluatiemateriaal in het verlengde van de leerdoelen, de hoofddoelen, de opdrachtformulering, en de probleemstelling?
M.a.w. is het evaluatiemateriaal (instrument en data) in staat om aan te tonen dat de leerdoelen, het hoofddoel en de gestelde opdracht - op werkgedrag niveau - al dan niet gerealiseerd zijn?

1.5.3.2. Geeft dit evaluatiemateriaal een gunstig of een ongunstig beeld van de gewenste veranderingen in werkgedrag?

1.5.4. Is er evaluatiemateriaal t.b.v. het organisatiegedrag (div. onderzoeksmateriaal):

1.5.4.1. Ligt dit evaluatiemateriaal in het verlengde van de leerdoelen, de hoofddoelen, de opdrachtformulering, en de probleemstelling?
M.a.w. is het evaluatiemateriaal (instrument en data) in staat om aan te tonen dat de leerdoelen, het hoofddoel en de gestelde opdracht - op organisatie gedrag niveau - al dan niet gerealiseerd zijn?

1.5.4.2. Geeft dit evaluatiemateriaal een gunstig of een ongunstig beeld van de gewenste veranderingen in organisatiegedrag? Vergelijk daarbij de volgende indicatoren:
- verbetering
  produktie:
  omzet:
  snelheid:
  kwaliteit:
  veiligheid:

milieu:
klantgerichtheid:
dienstbetoon:
- vermindering
fouten:
ongevallen:
uitval:
productie-stilstand:
kosten:
klachten:
- implementatie van innovaties:
technologisch:
informatisering/automatisering:
struktuur van de organisatie:
samenwerking:
andere indicatoren:

1.6. Lesmateriaal:

1.6.1. Is er een opleidingsplan (rooster-lessencyclus)
- Nee
- Ja:
- summiere dagindeling
- gedetailleerde dag- en urenindeling
- andere indeling:

1.6.1.1. Is er een zichtbare relatie tussen het opleidingsplan en de leerdoelen?
- gebruik van terminologie:
- verdeling van aktiviteiten overeenkomstig de soorten leerdoelen?
- passen de werkvormen bij de leerdoelen?

1.6.2. Is er een leerstofomschrijving?
- Nee
- Ja:
- aanduiding in kernwoorden
- uitvoerige beschrijving in de vorm van syllabi, dia's, film, videa, coo.
- verwijzingen naar bestaande (vak)literatuur/naslagwerk
- anders:

1.6.2.1. Is er een zichtbare relatie tussen de leerstofomschrijving en de leerdoelen?
- gebruik van terminologie:
- is de leerstof ondersteunend aan en relevant voor de soorten leerdoelen?

1.6.3. Bevat het lesmateriaal oefeningen, cases, rollenspelen, games, simulaties, practica enz.
- Nee
- Ja:
- aanduiding in kernwoorden
- uitvoerige beschrijving met oefenmateriaal, cases rolbeschrijvingen, video, coo, games enz.
- verwijzingen naar bestaande simulaties, games, (vak)literatuur
- anders:

1.6.3.1. Is er een zichtbare relatie tussen de oefeningen, cases enz. en de leerdoelen?
- gebruik van terminologie:
- passen de aktiviteiten bij de soorten leerdoelen?

1.6.4. Bevat het lesmateriaal opdrachten, praktijkopdrachten, zelfstudie enz. die buiten de klassikale bijeenkomsten door de cursist uitgevoerd worden?
- Nee
- Ja:
- aanduiding in kernwoorden:
- uitvoerige beschrijving van de opdrachten met oefenmateriaal, en literatuur
- anders:

1.6.4.1. Is er een zichtbare relatie tussen de opdrachten, praktijkopdrachten zelfstudie enz. en de leerdoelen?
- gebruik van terminologie:
- passen de aktiviteiten bij de soorten leerdoelen?

1.6.5. Bevat het lesmateriaal een omschrijving van leer- en hulpmiddelen?
Nee
Ja:
- aanduiding in kernwoorden:
- anders:

1.6.5.1. Is er een zichtbare relatie tussen het gebruik van leer- en hulpmiddelen en de leerdoelen?

1.7. Bevat het lesmateriaal aanwijzingen voor de docent, praktijkbegeleider, mentor, coach, chef bij het gebruik van het lesmateriaal?
Nee:

1.7.1. Ja, een handleiding voor de docent met de volgende kenmerken:
-
-
-

1.7.2. Ja, een handleiding voor de praktijkbegeleider, mentor, coach, chef met de volgende kenmerken:
-
-
-

1.7.3. Wat is je indruk van de vormgeving en de verzorging van het lesmateriaal:
- slordig en onoverzichtelijk
- er is aandacht besteed aan de verzorging
- de verzorging van het materiaal is van een hoge kwaliteit

1.8. Welke van de onderstaande funkties zijn betrokken bij de uitvoering van de opleiding:
- aantal docenten:
- aantal gastdocenten:
- aantal mentoren, coaches,
- de eigen chef:
- aantal leden van het hoger management:
- andere funkties:

1.9. Is er een kosten baten analyse uitgevoerd met betrekking tot deze opleiding?
Nee
Ja:

- een begroting van de direkte (out of pocket-) kosten met betrekking tot de uitvoering
- een begroting van de direkte (out of pocket-) kosten met betrekking tot de ontwikkeling
- een begroting van de loonsomkosten van de ontwikkeling
- een begroting van de loonsomkosten van docenten
- een begroting van de loonsomkosten van de cursisten
- een begroting van de lost-opportunity costs
- een kostenvergelijking met andere opleidingsaanpakken
- een indicatie van te verwachten baten
- een berekening van de baten

C. Handleiding bij de Interviews

1. Interview met de opdrachtgever:

1.1. Wat is de aanleiding geweest voor het ontwikkelen van deze opleiding?

1.1.1. Wat moeten de cursisten aan het einde van de opleiding beter kunnen?

1.1.2. Lukt dat?

1.2. Welk probleem zal met behulp van deze opleiding opgelost moeten worden?

1.3. Kan de oplossing van dat probleem d.m.v. leerprocessen bereikt worden? (opleidingsnoodzaak)
(gebrek aan vaardigheden, leerbaarheid van die vaardigheden, dispositie, motivatie)

1.4. Zijn er alternatieve oplossingen voor het probleem overwogen? Zo ja, welke?

1.5. Maakt de opdracht tot een opleiding deel uit van een omvangrijker probleemaanpak? (organisatie-verandering, verbetering hulpmiddelen, naslagwerk, herstrukturering van bevoegdheden, taakverrijking, ondersteunende vorm van leidinggeven. Zie Romiszowski, 1984; Kessels en Smit, 1989)
Zo ja, welke ?

1.6. Hoe luidt de opdracht?

1.7. Wat zullen in de toekomst indicatoren zijn dat dit probleem ook werkelijk opgelost is?

1.8. Op welke wijze is de opdrachtgever betrokken geweest bij de ontwikkeling van de opleiding?

1.9. Op welke wijze is de opdrachtgever betrokken geweest bij de uitvoering van de opleiding?

1.10. Op welke wijze is de opdrachtgever betrokken geweest bij de evaluatie van de opleiding?

1.11. Is de opdracht tot het ontwerpen en uitvoeren van een opleiding naar tevredenheid uitgevoerd?

1.12. Wat zijn sterke aspekten van de opleiding?

1.13. Wat zijn zwakke aspekten van de opleiding?

1.14. Welke invloed heeft de opleiding gehad op de wijze waarop de voormalige cursist nu zijn werk doet?

1.15. Zijn er indicaties dat het oorspronkelijke probleem door middel van deze opleiding opgelost is?

2. Interview met de ontwikkelaar(s)

2.1. Wat is de aanleiding geweest voor het ontwikkelen van deze opleiding?

2.1.1. Wat moeten de cursisten aan het einde van de opleiding beter kunnen?

2.1.2. Lukt dat?

2.2. Welk probleem zal met behulp van deze opleiding opgelost moeten worden?

2.3. Kan de oplossing van dat probleem d.m.v. leerprocessen bereikt worden?
(opleidingsnoodzaak)
(gebrek aan vaardigheden, leerbaarheid van die vaardigheden, dispositie, motivatie)

2.4. Zijn er alternatieve oplossingen voor het probleem overwogen? Zo ja, welke?

2.5. Maakt de opleiding deel uit van een omvangrijker probleemaanpak?
(organisatie-verandering, verbetering hulpmiddelen, naslagwerk, herstrukturering van bevoegdheden, taakverrijking, ondersteunende vorm van leidinggeven. Zie Romiszowski, 1984; Kessels en Smit, 1989)
Zo ja, welke ?

2.6. Wie is de opdrachtgever?
Hoe luidt de opdracht?

2.7. Wat zullen in de toekomst indicatoren zijn dat dit probleem ook werkelijk opgelost is?

2.8. Op welke wijze is de opleiding ontwikkeld?
(nauwkeurige beschrijving van de werkelijk gevolgde aanpak. Geen verwijzing naar modellen)

2.8.1. Op welke wijze is de opdrachtgever betrokken geweest bij de ontwikkeling van de opleiding?

2.8.2. Op welke wijze de chefs van de toekomstige cursisten?

2.8.3. Op welke wijze de toekomstige cursisten?

2.8.4. Op welke wijze de ervaren medewerkers?

2.8.5. Op welke wijze de materiedeskundigen?

2.8.6. Op welke wijze de docenten?

2.8.7. Welke overige personen zijn bij de ontwikkeling betrokken?

2.8.8. Welke problemen hebben zich bij de ontwikkeling van de opleiding voorgedaan?

2.9. Op welke wijze is de opleiding uitgevoerd:

2.9.1. Op welke wijze is de opdrachtgever betrokken geweest bij de uitvoering van de opleiding?

2.9.2. Op welke wijze de chefs van de toekomstige cursisten?

2.9.3. Op welke wijze ervaren medewerkers?

2.9.4. Op welke wijze materiedeskundigen?

2.9.5. Welke overige personen zijn betrokken bij de uitvoering van de opleiding?

2.9.6. Welke problemen hebben zich bij de uitvoering van de opleiding voorgedaan?

2.10. Op welke wijze is de opdrachtgever betrokken geweest bij de evaluatie van de opleiding?

2.10.1. Op welke wijze de chefs van de cursisten?

2.10.2. Op welke wijze de cursisten?

2.10.3. Op welke wijze de ervaren collega's van de cursisten?

2.10.4. Op welke wijze de materiedeskundigen?

2.10.5. Op welke wijze de docenten?

2.10.6. Welke overige personen zijn bij de evaluatie betrokken?

2.10.7. Welke problemen hebben zich bij de evaluatie voorgedaan?

2.11. Is de opdracht tot het ontwerpen en uitvoeren van een opleiding naar tevredenheid van de opdrachtgever uitgevoerd?

2.12. Wat zijn sterke aspekten van de opleiding?

2.13. Wat zijn zwakke aspekten van de opleiding?

2.14. Zijn er indicaties dat het oorspronkelijke probleem door middel van deze opleiding opgelost is?

2.15. Zijn er nog bijzonderheden over de opleiding te melden?

3. Interview met de docent(en):

3.1. Wat is de aanleiding geweest voor het geven van deze opleiding?

3.1.1. Wat moeten de cursisten aan het einde van de opleiding beter kunnen?

3.1.2. Lukt dat?

3.2. Welk probleem zal met behulp van deze opleiding opgelost moeten worden?

3.3. Kan de oplossing van dat probleem d.m.v. leerprocessen bereikt worden?

(opleidingsnoodzaak: gebrek aan vaardigheden, leerbaarheid van die vaardigheden, dispositie, motivatie)

3.4. Zijn er alternatieve oplossingen voor het probleem overwogen? Zo ja, welke?

3.5. Maakt de opleiding deel uit van een omvangrijker probleemaanpak?
(organisatie-verandering, verbetering hulpmiddelen, naslagwerk, herstrukturering van bevoegdheden, taakverrijking, ondersteunende vorm van leidinggeven. Zie Romiszowski, 1984; Kessels en Smit, 1989)
Zo ja, welke ?

3.6. Wie is de opdrachtgever?
Hoe luidt de opdracht?

3.7. Wat zullen in de toekomst indicatoren zijn dat dit probleem ook werkelijk opgelost is?

3.8. Op welke wijze is de opleiding ontwikkeld?
(nauwkeurige beschrijving van de werkelijk gevolgde aanpak. Geen verwijzing naar modellen)

3.8.6. Op welke wijze zijn de docenten bij de ontwikkeling van de opleiding betrokken?

3.8.7. Welke overige personen zijn bij de ontwikkeling betrokken?

3.8.8. Welke problemen hebben zich bij de ontwikkeling van de opleiding voorgedaan?

3.9. Op welke wijze is de opleiding uitgevoerd?

3.9.1. Op welke wijze is de opdrachtgever betrokken geweest bij de uitvoering van de opleiding?

3.9.2. Op welke wijze de chefs van de toekomstige cursisten?

3.9.3. Op welke wijze de ervaren medewerkers?

3.9.4. Op welke wijze de materiedeskundigen?

3.9.5. Welke overige personen zijn betrokken bij de uitvoering van de opleiding?

3.9.6. Welke problemen hebben zich bij de uitvoering van de opleiding voorgedaan?

3.10. Op welke wijze zijn de docenten betrokken geweest bij de evaluatie van de opleiding?

3.10.1. Welke overige personen zijn bij de evaluatie betrokken?

3.10.2. Welke problemen hebben zich bij de evaluatie voorgedaan?

3.11. Is de opdracht tot het ontwerpen en uitvoeren van een opleiding naar tevredenheid van de opdrachtgever uitgevoerd?

3.12. Wat zijn sterke aspekten van de opleiding?

3.13. Wat zijn zwakke aspekten van de opleiding?

3.14. Zijn er indicaties dat het oorspronkelijke probleem door middel van deze opleiding opgelost is?

3.15. Is het lesmateriaal een goede steun bij de uitvoering van de opleiding?

- opleidingsplan (rooster-lessencyclus)
- leerdoelen
- toetsen
- leerstofomschrijving
- oefeningen, cases, rollenspelen, simulaties, practica enz.
- opdrachten, praktijkopdrachten, zelfstudie enz.
- omschrijving van leer- en hulpmiddelen
- aanwijzingen bij het gebruik van het lesmateriaal
- handleiding voor de docent
- handleiding voor de praktijkbegeleider/ mentor/ coach/ chef:

3.16. Zijn er nog bijzonderheden over de opleiding te melden?

4. Interview met enkele chefs van de cursisten

4.1. Wat is de aanleiding geweest voor het geven van deze opleiding?

4.1.1. Wat moeten de deelnemers aan het einde van de opleiding beter kunnen?

4.1.2. Lukt dat?

4.2. Welk probleem zal met behulp van deze opleiding opgelost moeten worden?

4.3. Kan de oplossing van dat probleem d.m.v. leerprocessen bereikt worden?
(opleidingsnoodzaak: (gebrek aan vaardigheden, leerbaarheid van die vaardigheden, dispositie, motivatie)

4.4. Zijn er alternatieve oplossingen voor het probleem overwogen? Zo ja, welke?

4.5. Maakt de opleiding deel uit van een omvangrijker probleemaanpak?
(organisatie-verandering, verbetering hulpmiddelen, naslagwerk, herstrukturering van bevoegdheden, taakverrijking, ondersteunende vorm van leidinggeven. Zie Romiszowski, 1984; Kessels en Smit, 1989)
Zo ja, welke ?

4.6. Wie is de opdrachtgever?
Hoe luidt de opdracht?

4.7. Wat zullen in de toekomst indicatoren zijn dat dit probleem ook werkelijk opgelost is?

4.8. Op welke wijze is de opleiding ontwikkeld?
(nauwkeurige beschrijving van de werkelijk gevolgde aanpak. Geen verwijzing naar modellen)

4.8.1. Op welke wijze zijn de chefs van de toekomstige cursisten bij de ontwikkeling van de opleiding betrokken?

4.8.2. Welke overige personen zijn bij de ontwikkeling betrokken?

4.8.6. Welke problemen hebben zich bij de ontwikkeling van de opleiding voorgedaan?

4.9. Op welke wijze zijn de chefs van de toekomstige cursisten betrokken geweest bij de uitvoering van de opleiding?

4.9.1. Welke overige personen zijn betrokken bij de uitvoering van de opleiding?

4.9.2. Welke problemen hebben zich bij de uitvoering van de opleiding voorgedaan?

4.10. Op welke wijze zijn de chefs van de cursisten betrokken geweest bij de evaluatie van de opleiding?

4.10.1. Welke overige personen zijn bij de evaluatie betrokken?

4.10.2. Welke problemen hebben zich bij de evaluatie voorgedaan?

4.11. Is de opdracht tot het ontwerpen en uitvoeren van een opleiding naar tevredenheid van de chefs uitgevoerd?

4.12. Wat zijn sterke aspekten van de opleiding?

4.13. Wat zijn zwakke aspekten van de opleiding?

4.14. Zijn er indicaties dat het oorspronkelijke probleem door middel van deze opleiding opgelost is?

4.15. Is het lesmateriaal een goede ondersteuning bij de uitvoering van de opleiding?

- opleidingsplan (rooster-lessencyclus)
- leerdoelen
- toetsen
- leerstofomschrijving
- oefeningen, cases, rollenspelen, simulaties, practica enz.
- opdrachten, praktijkopdrachten, zelfstudie enz.
- omschrijving van leer- en hulpmiddelen
- aanwijzingen bij het gebruik van het lesmateriaal
- handleiding voor de docent
- handleiding voor de praktijkbegeleider/ mentor/ coach / chef:

4.16. Welke invloed heeft de opleiding gehad op de wijze waarop de voormalige cursist nu zijn werk doet?

4.17. Zijn er nog bijzonderheden over de opleiding te melden?

5. Interview met enkele cursisten:

5.1. Wat was de reden om aan deze opleiding deel te nemen?

5.2. Wat heb je er geleerd?

5.3. Wie heeft je voor deze opleiding opgegeven?

5.4. Waarom vond het bedrijf het belangrijk dat je deze opleiding zou volgen?

5.5. Welke invloed heeft de opleiding gehad op de wijze waarop je nu je werk doet?

5.6. Wat zijn de sterke punten van de opleiding?

5.7. Wat zijn de zwakke punten van de opleiding?

5.8. Op welke wijze heb je met je mentor / coach / of praktijkbegeleider samengewerkt?

5.9. Welke rol heeft je chef gespeeld tijdens de opleiding?

5.10. Hoeveel tijd kostten de huiswerkopdrachten?

5.11. Was het altijd mogelijk om de praktijkopdrachten uit te voeren?

5.12. Gebruik je nu, na de opleiding, nog wel eens je lesmateriaal?

5.13 Is de opleiding d.m.v. een toets of een examen afgesloten?

5.13.1. Was dat moeilijk of makkelijk?

5.14. Heb je tijdens de opleiding voldoende kunnen oefenen?

5.15. Werd er tijdens de opleiding met praktijkvoorbeelden gewerkt?

5.16. Was de docent op de hoogte van je werksituatie?

5.17. Eventueel aanvullende vragen op grond van de bestudeerde documenten en eerdere interviews.

D. Casusverslag van de Onderzoeker.

In dit casusverslag geeft de onderzoeker een zorgvuldig beargumenteerde verklaring voor het al dan niet succesvol zijn van de opleiding.

- De argumenten moeten ontleend zijn aan materiaal uit dit Data Collection Protocol (graag met verwijzingen).

- Van belang is dat in de veklaring de volgende zaken besproken worden:

= de probleemstelling:
- wat is het probleem;
- is er sprake van een opleidingsnoodzaak?

= de opdrachtformulering:
- is er een opdrachtformulering?
- past die opdrachtformulering bij de probleemstelling en de opleidingsnoodzaak?

= de ontwikkeling van de opleiding:
- is de opleiding op een zorgvuldige wijze ontwikkeld? (taakanalyses, leerdoelen, evaluatie-instrumenten, leerplan, lesmateriaal)
- is de opleiding gericht op in de praktijk noodzakelijke en toepasbare vaardigheden?
- is de werkplek (chef) betrokken bij de ontwikkeling?

= de uitvoering van de opleiding:
- is de opleiding uitgevoerd volgens het leerplan?
- is er naar gestreefd om de leerplek zoveel mogelijk op de werkplek te laten lijken?
- is de werkplek (chef en ervaren collega's) betrokken bij de uitvoering van de opleiding?

= de resultaten van de opleiding:
- hoe is er geëvalueerd?
- is er iets bekend over de leerresultaten, verandering in werkgedrag en eventueel verandering in het organisatiegedrag?
- is het oorspronkelijke probleem d.m.v. de opleiding opgelost?

Conclusie van de onderzoeker:

Deze opleiding is succesvol/niet-succesvol omdat:

APPENDIX II: CODING SCHEME (CASES)

Between parentheses the display is indicated to which the coded chunk of text is to be transferred.

1. Perceptions of managers, supervisors, developers, trainers and trainees of the initial problem?

M.P. = Management's perception of the problem
D.P. = Developer's " "
T.P. = Trainer's " "
S.P. = Supervisor's " "
E.P. = Employee's (Trainee) " "
R.P. = Researcher's " "

T.C. = Training Component: part of the problem that can be solved by training.
N.T. = Non-training aspect: those aspects that cannot be solved by training, or by training alone.
(Display I: Consistency between perceptions of the initial problem)

2. Involvement of managers, supervisors, developers, trainers, trainees and others during the development and implementation phases?

-.I.D. = Actors involvement during development
-.I.I. = Actors involvement during implementation
M.I.D. = Management involvement in development
M.I.I. = Management " implementation
D.I.D. = Developer " development
D.I.I. = Developer " implementation
T.I.D. = Trainer " development
T.I.I. = Trainer " implementation
S.I.D. = Supervisor " development
S.I.I. = Supervisor " implementation
E.I.D. = Employee " development
E.I.I. = Employee " implementation
O.I.D. = Other party's " development
O.I.I. = Other party's " implementation
(Display II: Actors' involvement)
(Display VI-1: Line managers' involvement)

3. Design and Development of the training programme

To describe the development process, the following elements will be looked for:

T.N.A. = Training needs assessment
G.O. = General objectives
T.A. = Task analysis
I.O. = Instructional objectives
E.C. = Evaluation criteria
E.I. = Evaluation instruments
L.S. = Design of learning situations
T.M. = Development of training materials
F.C.I. = Favourable conditions for implementation
S.T. = Selection and instruction of trainers
S.E.T. = Selection of employees for training
C.T.P. = Conducting the training programme
S.E. = Short term evaluation of the training
L.E. = Long term evaluation of impact
(Display III: Programme development)

4. Nature of instructional objectives.

I.O.-K. = Instructional objectives in terms of knowledge
I.O.-S. = Instructional objectives in terms of skills
(Display III: Programme development)
(Display IV: Internal programme consistency)

5. Evaluation criteria and evaluation instruments

E.C. = Evaluation criteria
E.I. = Evaluation instruments
E.I.-R. = Evaluation of Reactions
E.I.-L. = Evaluation of Learning Results
E.I.-P. = Evaluation of Performance
E.I.-I. = Evaluation of Organizational Impact
(Display III: Programme development)
(Display IV: Internal programme consistency)

6. Similarity between learning situations and work environment

T.P.C. = Training Process mainly in Classroom
T.P.J. = Training Process mainly on the job
L.S.W. = Learning situations similar to the workplace
(Display III: Programme development)
(Display IV: Internal programme consistency)
(Display VI-2: Learning situation - work environment)

7. Practical experience of the trainers in the subject matter field

S.T.-E. = Practical experience of the trainer in the subject matter field.
(Display VI-3: Practical experience of the trainer)

8. Has a cost-benefit analysis been carried out?

C.B.A. = Cost-benefit analysis
C.B.A.-D.C. = Direct costs
C.B.A.-O.C. = Elaborated with overhead costs
C.B.A.-S. = Elaborated with salary costs
C.B.A.-L.O. = Elaborated with lost opportunity costs
C.B.A.-B. = Elaborated with benefits
(Display V: Cost-Benefit Analysis)

9. Effects

M.P.-E. = Management's perception of the effects
D.P.-E = Developer's " "
T.P.-E = Trainer's " "
S.P.-E = Supervisor's " "
E.P.-E = Employees' (Trainees') "
(Display VII: Effects)

APPENDIX III: CROSS-SITE DISPLAYS (CASES)

Cross-Site: I	Consistency between perceptions of the initial problem (external consistency)							
Actor:	**Case 1**	**Case 3**	**Case 5**	**Case 7**	**Case 9**	**Case 11**	**Case 13**	**Case 15**
Manager	outcome*: implementation of new technology; output: quality system requires registration of trained personnel.	outcome: department is isolated; ineffective client contacts output: improvement of written communication; non-training comp.: improvement of information supply; problem solving sessions with other line managers.	outcome: implementation of new system; output: employees need to become open minded; non-training component: provide personal computers at the work site.	product: newcomers need to know about analysis techniques, and their methods of application.	outcome: improve information to clients on computer applications.	outcome: introduction of new system, for more efficient use of employees; output: proficient use of the system, according to safety regulations.	output: provide better management information; implement computer application; reduce questions to the application officer; non-training component: trial and error with application officers' support.	outcome: sell more products; output: improve systematic approach to clients; product: reduce fear of making risk analysis.
Developer	process: training should become more task oriented.	output: inadequate communication; product: overcome fear of written communication.	product: acceptance of automation policy; knowledge of privacy aspects.	output: inform newcomers of registration techniques; process: speak the same language.	outcome: improve computer information provided to clients; product: basic knowledge of computers.	outcome: more efficient use of personnel; process: existing training is not satisfactory.	output: implement computer application; product: improve users' skills.	product: lack of skills in the field of risk analysis, lack of knowledge about procedures. non-training component: make use of specialized consultants.
Trainer	(process)**	(output, product)	output: implementation of information system.	(output, process)	(outcome, product)	outcome: more efficient use of personnel.	(output, product)	product: employees are not sufficiently trained in financial matters.

Cross-Site: I	Consistency between perceptions of the initial problem (external consistency)							
Actor:	**Case 1**	**Case 3**	**Case 5**	**Case 7**	**Case 9**	**Case 11**	**Case 13**	**Case 15**
Supervisor	no problem	outcome: department ia isolated; output: written communication should improve.	output: prepare employees for the new system; product: knowledge of privacy aspects.	product: insufficient knowledge of registration techniques; non-training component: coach on the job.	outcome: improve computer information provided to clients; product: broader insight into information systems; non-training comp.: give each employee a personal computer.	outcome: more efficient use of personnel.	output: implement computer application; too many questions to application officer; non-training component: provide user guidelinea and offer support.	output: employees are afraid of discussing financial aspects with clients; product: lack of knowledge on financial matters.
Employee	product: more problem solving skills. output: job upgrade.	output: improvement of written communication inside and between departments.	process: compulsory	output: proper client presentation; speak the same language in the company.	no problem; product: get a better idea of terms and concepts of automation.	output: adequate and proficient operation of the new system; product: theoretical knowledge of the system.	output: implement computer application; product: improve skills in using applications.	output: perform a risk analysis to sell more products.
Data Collector	no problem	problem and training are poorly matched.	output: preparation of employees for new, automated information system.	not clear what the problem is that requires a solution.	outcome: clients should be better informed on applications of automation.	outcome: introduction of new system, for more efficient use of employees; output: proficient use of the system according to safety regulations.	output: implementation of management information system; product: improvement of users' skills.	outcome: sell more products; output: fear of discussing financial matters; product: lack of skills to relate the the subject to clients.
Conclusion	no consistency 0	vague communication problems. +	Apart from employees, consistency between perceptions. ++	no problem definition, content belongs to basic training. 0	no shared vision of the problem, consistency on outcome. ++	apart from employees, strong consistency on outcome. +++	apart from underlying problem (management information), consistency. +++	though underlying problem/goals are clear, the cause of the problem is not. +++

* the labels outcome, output, product & process (Kaufman, 1982, 1990; Kaufman, Stakenas, Wager & Mayer, 1981; Kaufman & Thiagarajan, 1987) have been added by the researcher.

** (–) in parentheses means that developer and trainer are the same individual.

Cross-Site: II	Actors' involvement during Development (D) and Implementation (I)							
Actor:	**Case 1**	**Case 3**	**Case 5**	**Case 7**	**Case 9**	**Case 11**	**Case 13**	**Case 15**
Manager	D: no I: no 0	D: hired trainer I: as trainee +	D: was informed I: was informed +	D: was informed I: was informed +	D: informed I: informed +	D: in steering committee D: approved of proposal I: was informed ++++	D: no I: no 0	D: in steering committee I: attended pilot training ++++
Developer	D: yes I: yes	D: used standard training I: as trainer	D: developed with trainers I: was informed	D: as developer I: as trainer	D: as developer I: as trainer	D: as developer I: conducted pilot	D: as developer I: as trainer	D: as developer I: attended pilot training
Trainer	(D: yes I: yes)	(D: used standard training I: as trainer)	D: assisted in D. I: as trainer	(D: as developer I: as trainer)	(D: as developer I: as trainer)	D: participated in task analysis I: as trainer	(D: as developer I: as trainer)	D: assisted I: as trainer
Supervisor	D: no I: no 0	D: no I: as trainee +	D: no I: as trainee +	D: as subject matter expert I: no +	D: contributed to task analysis I: as trainee. ++	D: participated in task analysis I: selected trainees and was assessor. ++++	D: no I: no 0	D: no I: as trainee +
Employee	D: yes I: yes	D: no I: as trainee	D: no I: as trainee	D: no I: as trainee	D: contributed to task analysis I: as trainee	D: no I: as trainee	D: no I: as trainee	D: no I: as trainee
Others	D: subject matter experts I: subject matter experts	D: no I: no	D: steering committee I: steering committee was involved in evaluation	D: subject matter experts. I: subject matter experts.	D: subject matter experts I: subject matter experts	D: subject matter experts D: training officer I: coaches	D: subject matter expert D: training manager contracted trainer I: no	D: subject matter experts I: subject matter experts in pilot
Conclusion	No involvement of management and supervisors during D. and I. 0	No involvement in D. Most actors were trainees. +	Managers, supervisors and employees did not know the content of the programme. Trainer and developer worked together closely. +	Besides discussing the desired content there is little involvement by different actors. +	Many actors were involved in D. and I. +++	Strong involvement of many actors in both D. and I. ++++	No involvement of managers and supervisors during D. and I. 0	Strong involvement in D. and I. of manager. Supervisor and employees belong to client system and are not involved in D. ++

Cross-Site: III	Programme development							
Item:	**Case 1**	**Case 3**	**Case 5**	**Case 7**	**Case 9**	**Case 11**	**Case 13**	**Case 15**
1: Training Needs analysis	no; changes in the existing training procedure	no	no	no	no	yes	no	no (training for clients)
2: General Objectives	output: reproductive and prod. skills (maintenance and trouble shooting)	product: writing skills	product: basic knowledge	(reconstr.) product: knowledge aspects	product: knowledge aspects output: client satisfaction	output: improved performance	product: prod. skills: use of computer applications	output: improved performance
3: Task Analysis	interviews, documents, observations	no	no	no	interviews	interviews, documents, evaluation of existing programme	no	no
4: Instructional Objectives	knowledge aspects	to become aware of problems	knowledge aspects	no	reproductive knowledge	10 obj. skills 100 obj. repr.knowledge	knowledge aspects	no
5: Evaluation Criteria	no; (reconstructed) output: greater self-sufficiency process: integration theory & practice.	no	no	no; (reconstr.) satisfied clients, satisfied trainees	no	no (reconstr.) output: improved performance	no	no (reconstr.) outcome: increased turn over
6: Evaluation instruments	process: format product: test of knowledge aspects (no skills)	process: oral	process: format	process; format	process: format	product: entry level test; th.& pr. exam; process: meeting of trainers and coaches	process: format	process: format; pilot; evaluation meetings;
7: Learning situation; instructional strategies	class. self-study and o-t-j	no information	class. instr. and cases	class. 2 days of lectures 1 day case work	class. th. & dem.	1/3 class. instr. and demonstration, case work, small groups. 2/3 o-t-j	class. instr. and demonstration	class. instr. and assignment
8: Training materials	elaborate	poor materials	elaborate training materials	simple lesson plan; textbook, 160 foils, cases	textbook and assignment	detailed lesson plan; elaborate material for classroom instr.	textbook and two cases	no lesson plan; elaborate materials

Cross-Site: III	Programme development							
Item:	**Case 1**	**Case 3**	**Case 5**	**Case 7**	**Case 9**	**Case 11**	**Case 13**	**Case 15**
9: Creating favourable circumstances for implementation	no	no information	no	no	no	no equipment is often lacking	no	many experts involved in developing textbook; pilot training; t-t-t; clients were not involved.
10: Selection and training of trainers	trainer is developer	manager hired external trainer	developer instructed trainers	subject matter expert; no experience as trainer	management trainee with little experience in subject matter	trainer: experienced subject matter expert (no t-t-t) coaches: experienced subject matter experts (t-t-t)	external trainer, was not acquainted with organization nor with computer applications	trainers are subject matter experts; t-t-t.
11: Selection of trainees	although meant for newcomers, all employees are sent	compulsory	compulsory	compulsory	supervisor informed employees	selection by entry level test	both users and application officers	each trainer was supposed to sell the programme to the client.
12: Conducting the programme	according to lesson plan	chaotic programme; conflicts with trainer; changed to team building	initially 2 days according to lesson plan, later on 1 day.	according to lesson plan	according to lesson plan	trainer added th.; larger groups than planned; o-t-j as planned.	programme followed chapters in textbook	no lesson plan; trainer followed chapters of textbook; theoretical lecturing; few exercises, which were difficult and discouraging.
13: Process evaluation and results	process: format product: test (knowledge reproduction)	process: oral	process: format	process: format	process: format	process: format product: th & pr exam	process: format process: training manager informed.	process: format; pilot training
14: Evaluation of performance and impact	no	no	no	no	no	no	no	no trainer is supposed to offer follow up.

Cross-Site: III	Programme development							
Item:	**Case 1**	**Case 3**	**Case 5**	**Case 7**	**Case 9**	**Case 11**	**Case 13**	**Case 15**
Conclusion	carefully designed materials; variety in learning situations; no needs assessment, little attention paid to implementation; knowledge reproduction, no skills. ++	no systematic design; no activities for creating favourable circumstances for implementation; poor materials; objectives do not correspond to notions of problems in organization. 0	no systematic development; no activities to improve implementation; elaborate training materials appear not to be job related; theoretical training does not focus on relevant problems. 0	no systematic development; much emphasis on collecting training content; inexperienced trainer. 0	no systematic development; inexperienced developer and trainer; focus on knowledge aspects and not on problems in organization. 0	careful and systematic development; elaborate materials; disagreement between developer and managers & trainers about the amount of theory. ++++	progr. not based on relevant tasks; no lesson plan; trainer has no experience with computer applications in this organization: two groups of trainees need different skills for their jobs. 0	no systematic development; training is textbook driven; theoretical focus with little attention to actual problems on the job. 0

t-t-t = train the trainer programme; o-t-j = on-the-job training .

Cross-Site: IV	Consistency between Assignment, Objectives, Evaluation, Learning Situations and Training Materials (Internal consistency)							
	Case 1	**Case 3**	**Case 5**	**Case 7**	**Case 9**	**Case 11**	**Case 13**	**Case 15**
Conclusions:	Weak consistency between assignment, objectives and evaluation. Instructional objectives focus mainly on knowledge aspects and reproductive skills; the intended productive skills are poorly represented. +	No consistency between objectives, evaluation, learning situations and materials. 0	No consistency between underlying problem, and objectives, learning situation and materials. 0	No consistency between reconstructed assignment on the one hand and learning situations and materials on the other hand. 0	Consistency between assignment, objectives, learning situation and materials. The programme is not consistent with the underlying problem in the organization. ++	Strong consistency between assignment, objectives, evaluation, learning situations and materials. ++++	No consistency between assignment and goals, and instructional objectives, learning situations and materials. 0	No consistency between reconstructed assignment and objectives, learning situations and materials. +

Cross-Site: V	COST-BENEFIT ANALYSIS							
ITEM:	Case 1	Case 3	Case 5	Case 7	Case 9	Case 11	Case 13	Case 15
DIRECT COSTS	salary developer salary trainer	no	no	no	no	no	project proposal by external trainer	no
EMPLOYEE SALARIES	salaries of trainees	no	no	no	no	no	no	no
OVERHEAD	no	no	no	no	no	no	no	no
LOST OPPORTUNITY	no	no	no	no	no	no	no	no
BENEFITS	no	no	no	no	no	no	no	no
Conclusions:	Specification of salaries of developer, trainer and trainees ++	no analysis 0	no analysis 0	no analysis 0	no analysis 0	no analysis 0	no analysis apart from trainer's fee +	no analysis 0

Cross-Site: VI	Line Management Involvement, Learning Situation and Practical Experience of the Trainer							
FACTOR:	**Case 1**	**Case 3**	**Case 5**	**Case 7**	**Case 9**	**Case 11**	**Case 13**	**Case 15**
1: Involvement of Line Manager	no involvement 0	no involvement; one supervisor was a trainee +	little involvement +	subject matter expert during development +	supervisor participated in task analysis +	strong involvement of managers and supervisors ++++	no involvement 0	management participated in steering committee +
2: Learning Situation Resembles Work Situation	yes: for newcomers no: for experienced employees ++	conflicts over discrepancies between training and daily work 0	theoretical classroom trsining with few transfer possibilities 0	theory is not applicable; case work resembles work situation +	theoretical classroom instruction; few transfer possibilities 0	trsining takes place in and near the workplace ++++	theoretical classroom instruction; no applicable skills 0	programme did not focus on the problems trainees encountered on the job 0
3: Practical Experience of the Trainer	trainer was not subject matter expert; little experience with actual work of trainees. 0	trainer (teacher in formal school system) is unfamiliar with work environment of trainees. 0	not acquainted with trainees' jobs and work environment; no practical experience 0	although trainer is subject matter expert, he is inexperienced as a trainer +	inexperienced trainer in both subject matter and in training 0	trsiners and coaches are very experienced ++++	trainer was not acquainted with equipment; trainer/developer had no experience in developing trsining programmes 0	trainers were subject matter experts without any experience in the trainees' daily work 0
Conclusions:	None of the three factors is very active	Apart from some management involvement, none of the factors is active	Apart from some management involvement, none of the factors is active	All three factors are minimally active	Little involvement, no factors are active in any other way	All three factors are active	None of the factors is active	Aside from some management involvement, none of the factors is active

Cross-Site: VII	Perceptions on Effects (Attained curriculum)							
Actor:	**Case 1**	**Case 3**	**Case 5**	**Case 7**	**Case 9**	**Case 11**	**Case 13**	**Case 15**
Manager	It is difficult to judge whether the training has an impact on performance. No evaluation of results has been carried out. We are not satisfied. There are no clear indications that the original problem has been solved.	Focus shifted from external communication between departments to internal communication. There is a stronger awareness about communication problems. Internal communication has improved, employees are more open, and franker and better able to deal with criticism. The climate has improved, although I am not sure the initial problem has been solved.	Employees understand the background and philosophy of automation. We are not fully satisfied because of the quality of the trainers. The training has probably had an influence on the ways of thinking. It is difficult to judge whether the training has contributed to solving the problem.	We are 60% satisfied; results should be improved; need better definition of the target group; shift in content. Although there is more knowledge, impact on performance cannot be determined;	(not available)	Training objectives are fully met. Management is fully satisfied. Trainee is confident on the job. Training is a valuable contribution to solving the problem.	Objectives are not fully met. Management is not satisfied. Although work is approached more efficiently, the results are not optimal. The problem has not been solved.	Gradually consultants identify the target groups better and make risk analysis. Inspectors still have to assist-support them. It is improving. We are enthusiastic about the cooperation between inspectors during development and implementation of the programme. Briefings take place before approaching a client. Demand for the automated system is increasing.
Developer	Trainees are able to test electronic equipment and to make use of the official reference material. Employees are not satisfied because they lack background knowledge and theory. Training is considered too shallow. There are no clear indications that the original problem has been solved.	30% improvement in communication skills. We are ambivalent about the training's success. The employees and the manager were positive. Members of the department are aware that they need to solve the problem themselves.	The reactions of trainees vary from disasters to successes. Management is not satisfied with the training. The initial problem has not been solved.	We have succeeded in applying the new skills, but the programme needs improvement. We are making progress. Programme is 60 to 80 % successful.	Evaluations are satisfactory. Training is not competency based. Participants have learned more about the subject.	Training objectives are fully met. Management is satisfied. Training is a valuable contribution to solving the problem.	The results vary between beginners and experienced employees. Although the training has been carried out according management's requirements, the programme is not successful. Impact on performance is low. The initial problem has not been solved.	Effects are difficult to judge. There is a change in approach of both inspectors and consultants. There are no suggestions for improving the programme. It is unclear whether there are indicators that the original problem has been solved.

Cross-Site: VII	Perceptions on Effects (Attained curriculum)							
Actor:	**Case 1**	**Case 3**	**Case 5**	**Case 7**	**Case 9**	**Case 11**	**Case 13**	**Case 15**
Trainer	trainer = developer	trainer = developer	Management is not satisfied with the training. Employees have become better acquainted with automation.	trainer = developer	trainer = developer	Everybody is satisfied with the training outcomes. Training is a valuable contribution to solving the problem.	trainer = developer	Although it is too early to draw firm conclusions, cooperation from participants has increased noticeably.
Supervisor	There is no clear relationship between the training and performance. There are no obvious results. Integration of theory and practice was not successful. No relationship between a perceived problem and training results. No effects on performance.	The effects of the training are minimal. We are not satisfied because the initial goal has shifted to team building. The initial problem has not been solved. There are no obvious results.	The training did more harm than good. Supervisors did not ask for this training. There is no idea of the effects on the initial problem. There is no influence on performance.	Insufficient application of skills on the job. Supervisor is only partially satisfied by the programme. The systematic approach has improved.	Improvement in client approach is probably about 75%. We are satisfied witht the programme, so there must be some impact. We have no indications that the initial problem has been solved yet. The trainee is more aware of different aspects.	Training objectives have been fully met. Management is satisfied. Training is a valuable contribution to solving the problem.	The results depend on the previous experiences of the trainee. Some supervisors are satisfied with the programme. I am not. There is too much emphasis on theory and little attention to practical work. I see no impact on performance.	Consultants still lack skills for making systematic financial risk analyses. It appears to be very specialised work. They do not practice very often; The consultants are not self sufficient yet in matters of life insurance products. Training does not have much added value.
Trainee	Performance did not change. You get more understanding. Training materials are not used in the work environment. Official reference materials that were part of the training programme are still used.	The training has had little influence on the work environment. I am more aware of using printed materials for communication. I do not use training materials in my job.	Training has had no influence on the performance. Training materials are not used on the job.	No impact on performance; some knowledge is useful. Training materials are rarely used on the job.	No impact on performance. Training materials are not used on the job.	Little impact on performance. Training materials are not used on the job.	I am able to use the system. Training materials are used as reference materials for some job aspects.	I still don't feel self sufficient in approaching clients. When I tried, I was not successful. On the other hand interest in life insurance products is growing in our department. It is a complex subject.

Cross-Site: VII	Perceptions on Effects (Attained curriculum)							
Actor:	**Case 1**	**Case 3**	**Case 5**	**Case 7**	**Case 9**	**Case 11**	**Case 13**	**Case 15**
Assessment by Experts:	9	14	7	12	10	22	12	14
Assessment by NVvO participants:	9	8	8	14	11	22	12	12
$\bar{X}$	9	11	7.5	13	10.5	22	12	13

Cross-Site: I	Consistency between perceptions of the initial problem (external consistency)								
Actor:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
Manager	outcome: unbalanced level of expertise; improved mobility. process: existing training was too theoretical; no focus on trouble shooting skills.	outcome: to improve contacts with clients; product: by developing communication skills.	outcome: new legislation requires output: skilful use of test equipment.	process: existing training for clients had to be adapted for our own employees. output: to analyse interactions with clients. product: to enlarge repertoire of communication skills.	output: implementation of appraisal system.	process: existing training was too theoretical. output: service engineers need to be proficient in several technical systems.	process: existing training is not satisfactory. output: reduce fear of computer systems. product: better insight into the consequences of the use of computers and security issues.	outcome: to sell more products. output: employee should become more self sufficient in their approach to clients. to improve cooperation between specialized staff members;. non-training comp.: hire specialized consultants.	output: lack of assistant managers; quality of management has to be improved. non-training component: experienced managers should coach their assistants.

Cross-Site: 1	Consistency between perceptions of the initial problem (external consistency)								
Actor:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
Developer	outcome: more systematic work approach. output: quality system requires training. no performance problems.	output: inadequate communication	outcome: new legislation requires output: skilful use of test equipment.	product: to gain insight into interactions between people.	output: implementation of appraisal system. product: supervisors need the communication skills to conduct appraisal interviews.	process: existing training was too theoretical. output: service engineers need to be proficient in several technical systems.	output: reduced resistance to computer systems. non-training component: provide each employee with personal computer, information fliers and help desk.	output: employees should become more self sufficient in their approach to clients. to improve cooperation between specialized staff members.	output: increased availability of assistant mangers.
Trainer	outcome: existing training automatically leads to increase of salary; process: existing training is too theoretical.	(output)	(outcome, output)	(product)	(output, product)	process: existing training is too theoretical; no practical training was provided.	(output, product, non-training comp.)	output: to sell more products, by product: acquiring the necessary skills; output: to improve cooperation between specialised staff members.	(output)
Supervisor	outcome: better informed employees are more involved in the work process.	no problem; manager wanted communication skills training.	outcome: new legislation requires output: skilful use of test equipment.	outcome: to improve client contacts. product: better interactions.	output: by means of the appraisal system good relationships between management and employees are maintained.	output: service engineers need to be proficient in several technical systems. product: this requires different way of thinking.	product: employees do not see the consequences of computer systems and their applications, nor the security aspects. non-training component: provide support when employees have problems with the system.	outcome: to sell more products.	output: quality of management should be improved. process: existing programme is too theoretical. non-training comp.: provide practical experience in the work environment.
Employee	product: to keep up with necessary level of knowledge.	process: compulsory training.	outcome: new legislation requires output: skilful use of test equipment.	output: personal development; improved interactions with others.	(output)	compulsory training	product: need to know more about computer systems. I hated computers.	outcome: to sell more products. output: to advise clients properly. product: to improve on performing correct analyses.	output: the need for more qualified managers.

Cross-Site: I	Consistency between perceptions of the initial problem (external consistency)								
Actor:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
Data Collector	outcome + process: dissatisfaction with existing training, which had no relationship with the job and was too theoretical.	outcome: to improve attitude towards clients. To become more service oriented.	outcome: new legislation requires output: skilful use of test equipment.	process: successful training for clients had to be adapted for own employees.	output: implementation of the appraisal system requires product: specific communication skills of the supervisors.	process: existing training was too theoretical; output: service engineers need to be proficient in several technical systems.	output: users of computer systems need to be more involved in implementation projecta. process: existing programme was not satisfactory.	output: to sell more products. product: acquiring the necessary skills; output: to improve cooperation between specialised staff members.	output: improving the quality of management; creating a pool of assistant managers. process: replacing the existing programme.
Conclusion	consistent: improvement of relationship training-performance. +++	no consistency 0	strong consistency ++++	consistentcy regarding adaption of existing training, no performance problem. +++	strong consistency ++++	strong consistency: process and output, except trainee. ++++	consistency in problem perception. +++	strong consistency on outcome and output. ++++	strong consistency on output. ++++

Cross-Site: II	Actors' involvement during Development (D) and Implementation (I)								
Actor:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
Manager	D: intensive I: cont. informed ++++	D: hired trainer I: as trainee +	D: no I: no 0	D: no I: informed of process evaluation +	D: approved curriculum. I: introduced programme. I: informed of process evaluation. ++++	D: steering comm. D: approved proposal. I: organized practical training. I: informed of evaluation results. ++++	D: project leader I: project leader ++++	D: offered facilities. D: approved training materials. I: planning & selection of trainees. I: was informed of process evaluation. ++++	D: intensively; organized practice. I: opening speech, guest speaker. I: analysed evaluations. ++++

Cross-Site: II	Actors' involvement during Development (D) and Implementation (I)								
Actor:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
Developer	D: yes I: yes	D:/I: used standard training	D: packaged material I: yes	D: participated in similar training I: was trainer	D: yes I: yes	D: yes I: conducted pilot	D: yes I: yes	D: developed programme I: participated in pilot	D: developed programme with management and subject matter experts I: conducted and coordinated training
Trainer	D: intensive I: yes	(D:/I: used standard training)	(D: packaged material I: yes)	(D: participated in similar training I: was trainer)	(D: yes I: yes)	D: participated in task analysis I: conducts training and organizes evaluation meetings	(D: yes I: yes)	D: developed materials I: conducted training	(D: as developer I: conducted and coordinated training)
Supervisor	D: intensive I: yes ++++	D: no I: as trainee ++	D: no I: as trainee ++	D: no I: no 0	D: no I: as trainee ++	D: participated in task analysis I: practical exam I: assists at evaluation meetings I: coord. coaches ++++	D: as trainee in pilot I: helped trainees with homework +++	D: participated in task analysis I: assisted trainees ++++	D: participated in task analysis I: coaches trainees ++++
Employees	D: no I: yes	D: no I: as trainee	D: no I: as trainee	D: no I: as trainee	D: no I: as trainee	D: participated in task analysis I: as trainee	D: no I: as trainee	D: participated in task analysis I: as trainee	D: no I: as trainee
Other	D: subj.matter expert. I: colleagues on the job.	D: no I: no	D: national training institute I: no	D: experienced colleagues I: no	D: personnel officers D: subj. matter expert I: personnel officer as trainee	D: subject matter experts D: training officer I: coaches	D: subject matter experts I: no	D: subject matter experts and client. I: subject matter experts and client	D: ext.consultants, subj. matter expert. I: personnel officers, sub. matter expert.

Cross-Site: II	Actors' involvement during Development (D) and Implementation (I)								
Actor:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
Conclusion	All actors involved in D. and I. Supervisors are main instructors, colleagues assist on the job. +++	No involvement of actors in D. Managers and supervisors were also trainees. +	D: standard training developed by national institute that also trained the trainer. No further involvement in I. except for supervisors and employees. +	little involvement. +	strong involvement of management and staff members during D: and I: Target group was not involved in D. +++	Strong involvement of many actors during D. and I. ++++	Involvement of many actors in D. and I. Employees are not involved in D. +++	Strong involvement of many actors (even clients) in both D. and I. ++++	Many actors are intensively involved in both D. and I. Employees did not participate in D. +++

Cross-Site: III	Programme development (systematic approach)								
Item:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
1: Training Needs analysis	process: improved training output: improved performance.	no	No formal needs assessment; procedures change	no	output: implementation of appraisal system	job enlargement	no	interview with top management	no
2: General Objectives	product: reproductive and productive skills	output: improved performance	output: performance with new procedures	no; (rec.) product: prod. skills	output: implementation of appraisal system	output: reproductive and prod. skills	product: reactive skills	output: prod. skills	output: qualified managers
3: Task Analysis	Interviews; observations; no records	no	no task analysis; standard package	no	no	records on: interviews, documents, critical incidents,	interviews, meetings, jury of experts.	interviews	survey, interviews, documents, brainstorming; no reports
4: Instructional Objectives	reproductive skills	productive skills	product: reproductive skills	no; formulated during training	product: repr. and prod. skills	product: repr. knowledge and skills	product: knowledge aspects	product: cognitive and interactive prod. skills	product: interactive skills and knowledge aspects

Cross-Site: III	Programme development (systematic approach)								
Item:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
5: Evaluation Criteria	output: impr. perf. outcome: customer satisfaction	no criteria	no criteria	no; (reconstructed) positive reactions to performance	no	(rec.) output: improved performance	no	(rec.)outcome and output	output: number of qualified managers; improvement of perf.; outcome: customer satisfaction.
6: Evaluation instruments	product: tests output: asses.o-t-j.	no instruments	no instruments	format for process evaluation	format for process; evaluation meetings	process: format product: exam (theory & practice); output: meetings	process: format product: test (quiz)	process: pilot, format; product: o-t-j assignments, observations.	process: format product: learner report; assignments; reports by coaches
7: Learning situation Instructional strategies	class. and o-t-j	no documents (rec.): interpersonal skills training	class. and practice	class. theory, role-playing, case studies	class. role playing practice o-t-j.	1/5 class. 4/5 o-t-j.	class., cases, role playing.	classroom instr. role playing, problem solving; o-t-j assignments	1/5 classroom lecturing & workshop 4/5 o-t-j.
8: Training materials	elaborate; guidelines for instr.	no materials	elaborate; guidelines	elaborate; guidelines	elaborate	elaborate; guidelines; existing reference materials.	elaborate	elaborate	elaborate
9: Creating favourable circumstances for implementation	no special activities	no special activities	no special activities	no special activities	management board stressed importance; opening speech	management put much effort into coaching system; introductory meetings for supervisors	preparatory meetings; supervisors attend pilot.	imbedded in larger project; managers, supervisors and employees were involved in preparations;	management active in organizing o-t-j and recruiting coaches
10: Selecting and training of trainers	supervisors and coll. attended t-t-t.	manager hired trainer	experienced; dedicated t-t-t	experienced consultant	experienced internal and external trainers	experienced employees and t-t-t	experienced external trainers	#1 experienced trainer #2 subject matter expert and coach	internal trainers; external trainers; o-t-j coaches
11: Selecting of trainees	supervisor selects trainees	compulsory for all	compulsory for all	trainee's initiative	all supervisors are trainees	supervisor selects trainees	trainee's initiative	supervisors selected trainees	trainees selected by supervisor, personnel. officer and assessment techniques.

Cross-Site: III	Programme development (systematic approach)								
Item:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
12: Conducting the programme	lesson plan: groups of 2 to 3; classroom and o-t-j. assessment.	2 1/2 days classroom instruction	according to lesson plan	according to lesson plan; input of trainees	75% lesson plan 25% open	according to lesson plan; equipment is not always available	according to lesson plan (extended)	according to lesson plan	according to lesson plan
13: Process evaluation and results	indications for better output	informal process evaluation	no documents on process evaluation	format for process evaluation	format for process evaluation	process; product: exams; meetings with supervisors, trainers and coaches	process: format product: test (quiz)	process: format	process: format product: appraisal interviews
14: Evaluation of performance and impact	no formal evaluation	no	no	no	no	no	no formal evaluation; indicationa for changing attitudes	product and output: assignment; outcome: increased turn over	no; indicators more flexible managers; changing culture.
Conclusion	systematically developed; no documents on needs assessment, task analysis and evaluation results; elaborate training materials. +++	no systematic development; only goals and objectives are documented. 0	central training institute developed programme and materials; provided t-t-t; no documents other than elaborate training materials. +	no systematic development; much emphasis on feedback after role play and case studies; elaborate training materials. +	no systematic development; elaborate training materials. +	systematic development; well documented; elaborate training materials; much emphasis on implementation and coaching. ++++	carefully designed programme; elaborate materials; discrepancy between general and instructional objectives. +++	systematically developed; elaborate materials; emphasis on creating favourable circumstances for implementation. ++++	carefully developed; strong emphasis of management on trainee internship; elaborate materials; evaluation instruments. ++++

Cross-Site: IV	Consistency between Assignment, Objectives, Evaluation, Learning Situation and Training Materials (Internal Consistency)								
	Case 2	Case 4	Case 6	Case 8	Case 10	Case 12	Case 14	Case 16	Case 18
Conclusions:	Strong consistency between objectives, tests, learning situations and training materials. Assignment reflects dissatisfaction with existing programme, rather than a clear view of desired outcomes. +++	Consistency is difficult to assess: no assignment, criteria or training materials. 0	Information on assignment and evaluation is missing. Strong consistency between objectives, learning situations and materials. +++	Consistency is difficult to assess: no assignment, objectives or criteria. Content viewed implicitly as objective; training activities and materials seem to serve these objectives. +	Strong consistency between aspects, although criteria are missing. +++	Strong consistency between objectives, evaluation instruments, learning situations, materials and assignment. ++++	Consistency between learning situation, training materials and the desired output. Assignment and evaluation criteria are missing. +++	Strong consistency between assignment, objectives, evaluation, learning situation and materials. ++++	Strong consistency between objectives, evaluation, practical training on the job. Weak consistency between objectives and classroom training. +++

Cross-Site: V	COST-BENEFIT ANALYSIS								
ITEM:	Case 2	Case 4	Case 6	Case 8	Case 10	Case 12	Case 14	Case 16	Case 18
DIRECT COSTS	development implementation salary developer salary trainers	no	no	no	no	days on development days on implementation	project proposal external institute	development costs; trainers' salaries; travel and lodging; conference centre	development and implementation costs; salaries of internal and external trainers
EMPLOYEE SALARIES	salaries	no	no	no	no	days on class. and practical training	no	employees salaries	salaries of trainees
OVERHEAD	no	no	no	no	no	no	no	training staff	no
LOST OPPORTUNITY	no	no	no	no	no	no	no	no	estimation
BENEFITS	no	no	no	no	no	no	no	estimation of increase in turnover	no

Cross-Site: V	COST-BENEFIT ANALYSIS								
ITEM:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
Conclusion	Cost analysis of direct and salary costs; No benefits calculated. ++	no analysis 0	no analysis 0	no analysis 0	no analysis 0	estimation of costs per trainee based on development, implementation and trainees' salaries. ++	external, direct costs +	Apart from lost opportunity costs, a cost-benefit analysis has been made. ++++	Extensive calculation of costs. Overhead and benefits are not stated. +++

Cross-Site: VI	Line Management Involvement, Learning Situation and Practical Experience of Trainer								
FACTOR:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
1: Involvement of Line Manager	develops training; selects trainees; is trainer; assesses output ++++	no involvement; was trainee +	little involvement +	little involvement +	strong involvement of management +++	strong involvement, both during development and implementation ++++	project manager; assisted by supervisor ++++	very strong ++++	very strong during development and implementation ++++
2: Learning Situation Resembles Work Environment	workplace is main learning site; classroom activities prepare workplace activities; assignments carried out in workplace ++++	discrepancy between learning situation and workplace. 0	acquisition of necessary skills; learning situation is similar to the work environment. ++++	acquisition of skills, in learning situations that are similar to the work environment. ++++	learning situation similar to work environment; assignments in the work environment. ++++	acquired skills are used in practice; large part is o-t-j; coaching by experienced colleagues. ++++	classroom training covered problems in daily life. ++++	content and activities match daily practice. ++++	practical part: very strong; classroom: skills training. +++
3: Practical Experience of the Trainer	trainer (supervisor) has extensive practical experience; o-t-j-trainers are experienced colleagues. ++++	no practical experience; partially informed of work environment. 0	trainer was familiar with the trainees' jobs. trainer was educated for this kind of programme. ++++	experienced and qualified for this type of training. ++++	external trainer had experience with this kind of training; internal trainer was a subject matter expert. ++++	classroom trainer is subject matter expert and attended train the trainer programme; coaches are experienced. ++++	external trainer #1 was more experienced than #2; lack of specific knowledge about the organization gradually disappeared. +++	experienced trainers, who continue coaching trainees in practice. ++++	coaches: excellent; internal and external trainers: fair or weak. ++

Cross-Site: VI	Line Management Involvement, Learning Situation and Practical Experience of Trainer								
FACTOR:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
Conclusions:	All three factors are very active.	None of the factors were active.	Apart from management involvement, two factors were active.	Apart from management involvement, two factors were active.	All three factors are active	All three factors are active.	Two factors were active; trainers' experience improved during project.	All three factors are active.	All three factors are active; management involvement is very strong.

Cross-Site: VII	Perceptions of Effects (Attained curriculum)								
Actor:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
Manager	There is evidence that the training leads to more systematic approach; that the initial problem will be solved. We are satisfied with the training; theory and practice are closely related.	There is more awareness about dealing with communication problems. The initial assignment has changed from external to internal communication. There is a more open climate in the department. It is not clear whether the problem has been solved.	(No manager available)	Participants are positive and behaviour has changed. Management is very satisfied. Training has impact on performance.	(not available)	Objectives are fully met. Management is satisfied. Employees are more self confident and more knowledgable. There is a considerable impact on performance.	Objectives are met fairly well. Management is satisfied with the programme. Employees participate in projects with broader knowledge. This programme is better than the former programme.	Training is very successful. There is no information on impact on performance.	Objectives have been met. Quality of management has improved. Management is satisfied. Trainees are better managers, more aware of and sensitive to the organizational context. There are several indicators that the programme has a strong impact on performance and on the organization.

Cross-Site: VII	Perceptions of Effects (Attained curriculum)								
Actor:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
Developer	Management is sstisfied with the training and the employees perform better.	The communication skills have improved by about 30%. Management is ambivalent about the effects of the training.	The training is successful in reaching the objectives. Participants are enthusiastic. Influence on the initial problem is not clear.	Participants acquire new skills and are enthusiastic about the programme. Management is satisfied. Added value is recognized by colleagues.	Objectives are met for about 80%. Management is probably satisfied. There are important indicators that the initial problem has been solved.	There are positive evaluations. Management is satisfied. Employees are more competent and self confident. Problems are being solved faster.	Although there is no objective evaluation, a feeling of success prevails. Management is satisfied with the cooperation and the training approach. The attitude towards automation has improved.	Objectives are met fairly well. Management is satisfied. Evaluations show a positive effect on the initial problem.	Objectives have been met. Management is satisfied. There are indicators that programme has a positive impact on the initial problem.
Trainer	Management is sstisfied; fewer mistakes are being made in the work environment.	trainer = developer	trainer = developer	trainer = developer	trainer = developer	Management is fully satisfied. Training is shorter and has a more practical orientation.	There are positive rumours of success; management is sstisfied.	Management is very enthusiastic. It is too early to say something about impact on the initial problem.	trainer = developer
Supervisor	Employees perform better. Quality of the products has improved. Commitment of employees is stronger. Communication on problems and work is better.	No visible results of the training. Communication with clients has improved. We are not satisfied with the training.	We are satisfied with the new skills and their application on the job. We are satisfied about the training. Only very few mistakes are being made.	Although there is little difference in behaviour, employees have more skills to recognise critical situations. Participants are very satisfied with the training. Cooperation with participants of the programme is smoother, which influences project assignments. Better communication, and a careful approach of difficult situations.	(not available)	Training objectives are met. Management is satisfied. Training meets requirements. Employees have a broader background.	Objectives are met. I am satisfied with the results. A positive attitude has grown. There is less resistance to automation.	There are indications that the programme is successful, but it is too early to say something about impact on the initial problem. We are satisfied with the programme. There is a positive attitude to the job.	The trainees have mastered the skills better than their predecessors. Management is satisfied. Initial problem has improved a lot. Programme has a positive impact on performance. Improved self confidence and independence.

Cross-Site: VII	Perceptions of Effects (Attained curriculum)								
Actor:	**Case 2**	**Case 4**	**Case 6**	**Case 8**	**Case 10**	**Case 12**	**Case 14**	**Case 16**	**Case 18**
Employee	We work with more pleasure and more accurately. You know more about what you are doing; you know answers to the questions asked during your work. We still use the training materials on complex equipment.	Influence of the training on performance is not strong. Now I enjoy work more.	Better prepared for the job. Initially training materials are used on the job.	Little impact; more skills in group dynamics. Training materials are rarely used on the job.	Performance has not dramatically changed. My performance has improved. Training materials are regularly used on the job.	Without training I could not perform. Training materials are sometimes used as reference materials on the job.	My attitude towards automation has become more positive. I understand more about automation projects. Training materials are not used on the job.	Cooperation between us and colleagues from other departments has improved. Training materials have not yet been used on the job.	Improved performance as a manager. Training materials are sometimes used as reference materials on the job.
Assessment by Experts:	21	13	18	24	19	22	17	18	21
Assessment by NVvO participants:	20	11	15	15	19	23	16	15	21
$\bar{X}$	20.5	12	16.5	19.5	19	22.5	16.5	16.5	21

Cross-Site Macro Display XII: Ranked Cases, Relational Approach, External Consistency, Systematic Approach, Internal Consistency and Cost-Benefit Analysis
as assessed by the researcher.

Ranked Cases	V** Cost-Benefit Analysis	I External Consistency	VI & II Relational Approach	IV Internal Consistency	III Systematic Approach
1=# 12	++	++++	++++	++++	++++
2=# 11	0	+++	++++	++++	++++
3=# 18 *	+++	++++	+++	+++	++++
4=# 2	++	+++	++++	+++	+
5=# 10 *	0	++++	++++	+	+
6=# 8 *	0	+++	+++	++++	+
7=# 16	++++	++++	++++	++++	++++
8=# 14 *	+	+++	+++	+++	+++
9=# 6 *	0	++++	+++	+++	+
10=# 15	0	+++	++	+	0
11=# 7 *	0	0	+	0	0
12=# 13 *	+	+++	0	0	0
13=# 4 *	0	0	0	0	0
14=# 3 *	0	+	0	0	0
15=# 9 *	0	++	+	++	0
16=# 1 *	++	0	+	+	++
17=# 5	0	++	0	0	0

* when developer = trainer
** Display #

APPENDIX IV: SCALES OF MAIN VARIABLES IN CASES

Scale: Systematic Approach in Cases

Item:	k	$\overline{X}$	s	r_{it}	α
Adequate assessment of training needs	5	2.07	.84		.45 **
Adequate description of goals	5	3.97	.74		.28 **
Adequate task analysis	5	2.19	1.26		.22 *
Adequate instructional objectives	5	2.87	1.26	.49	.88
Adequate establishment of evaluation criteria	5	1.82	1.38	.62	***
Adequate construction of evaluation instruments	5	2.55	1.18	.82	.81
Adequate design of learning situations	5	4.07	1.06		-.03 **
Adequate development of course materials	5	3.66	1.23	.33	.92
Scale α: .76		2.72	.96		

Scale: Internal Consistency in Cases

Item:	k	$\overline{X}$	s	r_{it}	jury α
Consistency of goals	5	2.71	1.76	.23	***
Consistency of task analysis	5	1.94	1.56	.65	***
Consistency of instructional objectives	5	2.47	1.07		.09 *
Consistency of evaluation criteria	5	2.77	1.56	.86	***
Consistency of evaluation instruments	5	2.36	1.18		.56 *
Consistency of learning situations	5	3.12	1.36	.63	.82
Consistency of course materials	5	2.87	1.44		.52 *
Scale α: .77		2.63	1.20		

Scale points:
1 = higly inadequate elaboration on this item/ totally inconsistent with preceding items
2 = inadeqaute elaboration on this item/ little consistency with preceding items
3 = barely adequate elaboration on this item/ moderate consistency
4 = quite adequate elaboration on this item/ highly consistent with preceding items
5 = more than adequate elaboration on this item/ extremely consistent with preceding items
(*) denotes item deleted as jury $\alpha < .60$
(**) denotes item deleted as sub-scale $\alpha < .60$
(***) denotes item observed by researcher only.

Scale: Relational Approach in Cases

Item:	k	$\overline{X}$	s	r_{it}	α
Adequate assessment of training needs	5	2.07	.84		.45 *
Adequate task analysis	5	2.19	1.26		.22 *
Creation of favourable conditions for implementation	5	2.18	1.70	.39	***
Adequate Selection of trainers and coaches	5	3.65	1.54	.83	***
Adequate selection of trainees	5	3.06	1.68	.73	***
Involvement of line management	5	2.54	1.54	.72	.83
Learning situation resembles work environment	5	2.94	1.98	.70	***
Trainers' experience with the work of the trainees	5	3.00	1.75	.57	.91
Scale α: .89		2.89	1.31		

Scale: External Consistency in Cases

Item:	k	$\overline{X}$	s	r_{it}	α
Scale of separate assessments of consistency between actors' perceptions by Judge 1	5	2.68	1.05	.64	scale α: .92
General assessment of consistency by Judge 1	5	3.11	1.05	.58	r = .92 p<.001
Scale of separate assessments of consistency between actors' perceptions by Judge 2	5	3.31	.84	.81	scale α: .86
General assessment of consistency by Judge 2	5	3.24	1.14	.89	r = .82 p<.001
Scale of separate assessments of consistency between actors' perceptions by Judge 3	5	3.30	1.27	.90	scale α: .95
General assessment of consistency by Judge 3	5	3.59	1.54	.80	r = .95 p<.001
Scale α: .91		3.21	.98		

Scale: Cost-Benefit Analysis

Item:	k	$\overline{X}$	s	r_{it}	jury α
Assessment by data analysists	5	1.88	1.36	.93	****
Assessment by researcher	5	1.88	1.27	.93	****
Scale α: .96		1.88	1.29		

(****) denotes item with single score

Scale: Effects of Cases

Item:	k	$\overline{X}$	s	r_{it}
Assessments by experts: scale α: .92				
Statements of top managers	5	3.47	1.12	.85
Statements of supervisors	5	2.71	1.39	.86
Statements of developers	5	3.35	1.11	.79
Statements of trainers	5	3.29	.99	.77
Statements of trainees	5	2.88	1.27	.86
Assessment by NVvO participants: scale α: .89				
Statements of topmanagement	5	3.35	1.11	.88
Statements of supervisors	5	2.71	1.45	.90
Statements of developers	5	3.12	.99	.69
Statements of trainers	5	3.12	.93	.70
Statements of trainees	5	2.47	1.23	.62
Scale α: .94		3.08	.96	

Scale points:

1= the programme has not led to any new skills or changes in the work environment and has not had an impact on the organization.

2= the programme has led to few new skills or changes in the work environment and has had a minor impact on the organization.

3= the programme has led to some new skills and changes in the work environment and has had some impact on the organization.

4= the programme has led to new skills and changes in the work environment and has had a great impact on the organization.

5= the programme has led to very many skills and changes in the work environment and has had a tremendous impact on the organization.

Correlation between the ratings of experts and NVvO workshop participants r = .85

APPENDIX V:
Successful and Unsuccessful Cases: *t* Values

Cases: *EFFECT* *Scale:*	*Unsuccessful n=8* *<3.00* $\overline{X}$	*s*	*Successful n=9* *>3.00* $\overline{X}$	*s*	*t*	*df* *	*p*
Systematic Approach	2.11	.49	3.27	.96	-3.18	12.14	.008
Internal Consistency	1.80	.52	3.40	1.16	-3.64	11.39	.004
Relational Approach	1.65	.35	3.99	.62	-9.38	15	.000
External Consistency	2.53	.80	3.81	.68	-3.56	15	.003
Cost-Benefit	1.31	.70	2.39	1.52	-1.91	11.57	.081
Effect	11.00	1.95	19.33	2.38	-7.83	15	.000

* differences in *df* are caused by differences in computation, dependent on whether the two standard deviations are equal or not according to the *F* test.

APPENDIX VI:
Instructions for Assessing External Consistency (cases and projects)

PROJECT:

Consistency Between Perceptions of Actors

Instructions for assessing consistency between the perceptions of actors in educational programmes.

The following table displays the different actors' perceptions of both the problem that instigated the educational programme and the desired skills. Assessments of these views should indicate to which degree they concur with or diverge from one another and address both general and specific consistencies:

1. Specific assessments (items 1 through 10):
Assess the specific consistency between the perceptions of two (groups of) actors by assigning a score of 1, 2, 3, 4, or 5 to each item. 1 indicates no consistency whatsoever, while 5 indicates a very high degree of consistency. If the same person is both the developer and the trainer, mark Item 5: '='. The other items view the developer and the trainer as two separate individuals, albeit with identical scores for consistency.

2. General assessment (Item 11):
Assign a score of 1, 2, 3, 4, or 5 to indicate the overall consistency between the perceptions of the different actors. 1 indicates no consistency whatsoever, while 5 indicates a very high degree of consistency.

Relationship:	**Actor 1:**	Score:	**Actor 2:**
1	Manager		Developer
2	Manager		Trainer
3	Manager		Supervisor
4	Manager		Employee = Trainee
5	Developer		Trainer
6	Developer		Supervisor
7	Developer		Employee = Trainee
8	Trainer		Supervisor
9	Trainer		Employee = Trainee
10	Supervisor		Employee = Trainee
11	General Assessment of Consistency		Remarks:

Appendix VII:
ASSESSMENT MANUAL FOR CURRICULUM DESIGN

Developers have received detailed design instructions. This tool for analysis is based on these instructions. Please return the completed list to the researcher at the end of the interview. This list will serve as basis for improving the design instructions.

Scores:
Give each item a score on a scale ranging from 1 to 5 (except for items 12, 13, and 14). Space is available for comments following each item. Some items consist of several questions concerning practical applications of the main question. The scores for these items should reflect consideration of the answers to all questions within the item.

Explanation of scores for items 2 through 11:
Answers to these items should take two factors into consideration: whether the elaboration on this item is adequate (A), and whether the nature of this elaboration is consistent (C) with the discussions about the other items. Consistency entails the establishment of a meaningful link between issues such as training needs, instructional objectives, evaluation criteria, and learning situations.
Scores of 1 through 5 on items 2 through 11 denote the following:

Adequacy (A=):
1 = highly inadequate elaboration on this item.
2 = inadequate elaboration on this item.
3 = barely adequate elaboration on this item.
4 = quite adequate elaboration on this item.
5 = more than adequate elaboration on this item.

Consistency (C=):
1 = this item is totally inconsistent with preceding items.
2 = little consistency exists between this item and preceding items.
3 = moderate consistency exists between this item and preceding items.
4 = this item is highly consistent with preceding items.
5 = this item is extremely consistent with preceding items.

Explanation of scores for items 12, 13, and 14:
These items indicate only whether the first execution of the curriculum has taken place. Consequently, the answer is either **yes** or **no**.

Explanation of scores for Item 1 and items 15 through 19:
These scores reflect the adequacy of the elaboration on each item. Consistency is irrelevant in these cases. Scores range from 1 to 5, with 1 being the most inadequate and 5 the most adequate according to the preceding explanation of **Adequacy (A)**.
Explanation of Item 20: **Additional Remarks**.
Item 20 provides an opportunity to record additional remarks. No score is necessary here.

CURRICULUM DESIGN BY: Assessed by:

Item	Description	Score
1	Has the **Training Need** been assessed carefully? Is it clear whether learning processes can (help) solve the problem? Have non-educational approaches been considered? Remarks:	A =
2	Is there a description of the **Goals** (main goals)? Are there descriptions of target group(s), main skills, and possible support activities in the work environment? Remarks:	A = C =
3	Are **Task Analyses** available to: - stipulate the main goals, - gather information regarding evaluation criteria, and - trace favourable and unfavourable working conditions? Remarks:	A = C =
4	Have the task analyses served to express the main goals in terms of **Instructional Objectives**? Do these objectives cover the following fields: - cognitive skills - interactive skills - reactive skills - psycho-motor skills Will these skills help solve the original problem? Remarks:	A = C =
5	Have **Evaluation Criteria** been established to determine whether the curriculum has reached its goals? Do these criteria include guidelines for evaluating the following aspects: - learning process - learning results - performance - organizational impact Do the evaluation criteria for learning results reflect the **Instructional Objectives** (Item 4)? Do the criteria for performance and impact reflect the **Training Need** (Item 1)? Remarks:	A = C =
6	Are **Evaluation Instruments** available to gather information to be tested according to the preceding criteria (i.e. learning process, learning results, performance improvements, and organizational impact)? Remarks:	A = C =

Item	Description	Score
7	Have **Learning Situations** been designed that serve the instructional objectives and enable trainees to achieve these goals? Learning situations imply the educational methods selected (such as on-the-job training, in classrooms, or privately) and to the educational activities (such as assignments, exercises, instructions, case studies, role playing, games, simulations, and internships). Remarks:	A = C =
8	Are detailed **Course Materials** available to meet the requirements of the preceding learning situations? These materials include study guides, reference manuals, job aids, exercise material, assignments, case studies, role playing, games, visual aids, demonstration equipment, models, simulation materials, and guides for trainers and coaches. Remarks:	A = C =
9	Have **Favourable Conditions** for the implementation of the educational programme been created that provide information and stimulate involvement? (These conditions entail reporting goals, design, execution, necessary facilities, and tools for both learning situations and the work environment to top managers, managers and supervisors, trainers, coaches, trainees, and planners.) Remarks:	A = C =
10	Is there a **Selection of Trainers and Coaches**? Do the individuals in charge of carrying out the programme possess: - subject matter expertise - practical experience regarding the work of the trainees - instructional (or social) skills suited to the recommended instructional strategies Remarks:	A = C =
11	Is there a **Selection of Trainees**? Are there measures to recruit participants for the programme from the target group? Remarks:	A = C =
12	Has there been a trial **Execution of the Programme**? Did this execution reflect the original design? Has this trial execution generated suggestions for modifications? Remarks:	Y/N
13	Is there an **Evaluation of the Learning Process and the Learning Results**? Is it clear whether the learning process has proceeded smoothly (process evaluation)? Has a test of competency been conducted (assessment of learning results)? Remarks:	Y/N

Item	Description	Score
14	Is there an **Evaluation of Performance and Impact?** Is it clear whether this curriculum has improved the work environment (performance)? Is it clear whether the original goal has been reached and whether the original problem has been solved (impact)? Remarks:	Y/N
15	Is there a **Cost-Benefit Analysis?** Is information available regarding: - direct costs - trainees' salaries - overhead costs - lost opportunity costs - indication of added value Remarks:	A =
16	Has the curriculum been developed as a **Project?** Is there a project plan consisting of several stages, a top manager, a project manager, and a project team? Remarks:	A =
17	Is **Line Management Involved** in the development and implementation of the project? Remarks:	A =
18	Does the **Learning Situation Closely Resemble the Work Environment?** Do the activities in the trainees' learning situation resemble their tasks in their work environment? Do the learning situations focus on problems from the work environment? Remarks:	A =
19	Do **Trainers have experience with the work of the trainees?** More specifically, do they have experience with the work that plays a key role in this curriculum? Remarks:	A =
20	Additional remarks:	n.a.

APPENDIX VIII: Questionnaire for Programme Effects

Investigation: Quality of Corporate Education

Questionnaire concerning the educational programme on:

.....

developed by .....

This questionnaire is to be completed by the **Manager**.

1. What instigated the development of this educational programme?
   .....
   .....
   .....

2. How satisfactory was the execution of the assignment?

unsatisfactory	rather unsatisfactory	somewhat satisfactory	quite satisfactory	very satisfactory

3. What is the basis for your response to Question 2?
   .....
   .....
   .....

4. Which new skills should participants acquire from this educational programme?
   .....
   .....
   .....

5. How successful has the educational programme been with respect to Question 4?

unsuccessful	slightly successful	somewhat successful	very successful	highly successful

6. Has participants' performance benefitted from the new skills?

not at all	slightly	somewhat	considerably	very much indeed

7. Has the educational programme significantly affected the work environment or the department in general?

not at all	slightly	somewhat	considerably	very much indeed

8. Which changes have you perceived in the work environment or in the department?

.....
.....
.....

9. Has the educational programme had a significant impact on the organization?

not at all	slightly	somewhat	considerably	very much indeed

10. What are the indicators of the educational programme's impact on the organization?

.....
.....
.....

11. Please comment on the development of the educational programme.

.....
.....
.....

12. Please comment on the execution of the educational programme.

.....
.....
.....

13. Which factors have been essential in achieving favourable results?

.....
.....
.....

14. Which factors have impeded achieving the desired results?

.....
.....
.....

15. Please list any additional remarks relevant to the educational programme's effect on the organization.

.....
.....
.....
.....

APPENDIX IX: Scales of Main Variables in Projects

Scale: Systematic Approach in Projects

Item:	k	$\overline{X}$	s	r_{it}	jury α
Adequate assessment of training needs	5	4.12	.74	.55	.73
Adequate description of goals	5	4.11	.70	.78	.81
Adequate task analysis	5	4.13	.75	.77	.81
Adequate instructional objectives	5	4.13	.53		.55 *
Adequate establishment of evaluation criteria	5	3.88	.91	.69	.83
Adequate construction of evaluation instruments	5	3.72	.86	.76	.78
Adequate design of learning situations	5	4.05	.64		.59 *
Adequate development of course materials	5	4.08	.64	.52	.70
Scale α: .87		4.00	.46		

Scale: Internal Consistency in Projects

Item:	k	$\overline{X}$	s	r_{it}	jury α
Consistency of goals	5	3.85	.88	.71	.80
Consistency of task analysis	5	3.85	.84	.70	.77
Consistency of instructional objectives	5	3.80	.70		.58 *
Consistency of evaluation criteria	5	3.57	.91	.81	.74
Consistency of evaluation instruments	5	3.54	.85	.86	.61
Consistency of learning situations	5	3.92	.71	.53	.62
Consistency of course materials	5	3.98	.63		.48 *
Scale α: .88		3.74	.52		

1 = higly inadequate elaboration on this item/ totally inconsistent with preceding items
2 = inadequate elaboration on this item/ little consistency with preceding items
3 = barely adequate elaboration on this item/ moderate consistency with preceding items
4 = quite adequate elaboration on this item/ highly consistent with preceding items
5 = more than adequate elaboration on this item/ extremely consistent with preceding items.

(*) denotes to be deleted as jury $\alpha < .60$

Scale: **Relational Approach in Projects**

Item:	k	$\overline{X}$	s	r_{it}	jury α
Adequate assessment of training needs	5	4.04	.74	.51	.73
Adequate task analysis	5	4.05	.75	.53	.81
Creation of favourable conditions for implementation	5	3.74	.81	.82	.70
Adequate Selection of trainers and coaches	5	3.62	.90	.70	.71
Adequate selection of trainees	5	3.73	.96	.73	.77
Adequate project management	5	3.85	.91	.78	.81
Involvement of line management	5	4.85	.82	.77	.72
Learning situation resembles work environment	5	4.11	.57		.41 *
Trainers' experience with the work of the trainees	5	3.89	1.06	.64	.85
Scale α: .89		3.85	.36		

Scale: External Consistency in Projects

Item:	k	$\overline{X}$	s	r_{it}	n ** $r > .40$
Consistency assessed by Judge 1	5	3.18	.64	.40	6
Consistency assessed by Judge 2	5	3.12	.99	.60	9
Consistency assessed by Judge 3	5	3.47	.62	.89	9
Scale α: .75		3.25	.63		

** denotes the number of assessed pairs of perceptions (#1 to 10 in Appendix VI) that correlate with the general assessment of consistency (#11) $r > .40$.

Scale: Effects in Projects***

Item:	k	$\overline{X}$	s	*Total* r_{it}	*Perform.* r_{it}
1. Satisfaction	5	4.11	.23	.05	
2. New Skills	5	3.76	.34	.52	.67
3. Improved Performance	5	3.71	.30	.76	.79
4. Impact on Department	5	3.31	.29	.72	.46
5. Impact on Organization	5	3.07	.62	.60	
EFFECT-Total (items 1,2,3,4,5) Scale α: .72		3.59	.26		
EFFECT-Performance (items 2,3,4) Scale α: .79		3.60	.26		

*** Included are those projects where at least 75% of the actors, from whom at least four effect scores are available, presented a jury $\alpha \geq .60$.

Scale points:
1= not at all consistent/effective
2= slightly consistent/effective
3= somewhat consistent/effective
4= very consistent/effective
5= highly consistent/effective

APPENDIX X: Numbers of Respondents in Projects

Project	respondents	manager	supervisor	developer	trainer	trainees
4	4	1		1	1	1
5	6			1		5
6	8	1	1	1	1	4
9	7	1		1	1	4
10	12	1	3	1	4	3
11	8		4	1	1	2
12	7	1	1	1		3
16	6	1		1	1	3
18	5	1	1	1	1	1
21	6		1	1		4
22	5	1	1	1	1	1
23	10	1	2	1		6
24	10	2	2	1	1	4
26	9	1	1	1	1	5
TOTAL	103	12	17	14	13	46

APPENDIX XI: Projects and Cases: *F* values

Scale: Systematic Approach

Group:	*n*	$\overline{X}$	*s*	*F*	*df*	*p*	0	1	2	3
unsuccessful cases 0	8	2.11	.49							
successful cases 1	9	3.27	.96				*			
satisfactory projects 2	5	3.87	.38				*			
high performance projects 3	9	4.31	.29				*	*		
		3.37	1.05	17.67	3, 27	.000				

Scale: Internal Consistency

Group:	*n*	$\overline{X}$	*s*	*F*	*df*	*p*	0	1	2	3
unsuccessful cases 0	8	1.81	.52							
successful cases 1	9	3.37	1.16				*			
satisfactory projects 2	5	3.55	.37				*			
high performance projects 3	9	4.15	.47				*			
		3.22	1.15	14.76	3, 27	.000				

Scale: Relational Approach

Group:	*n*	$\overline{X}$	*s*	*F*	*df*	*p*	0	1	2	3
unsuccessful cases 0	8	1.65	.35							
successful cases 1	9	4.00	.62				*			
satisfactory projects 2	5	4.06	.10				*			
high performance projects 3	9	4.19	.45				*			
		3.45	1.17	56.47	3, 27	.000				

(*) denotes pairs of groups significantly different at $p < .10$ level, according to the Scheffé procedure.

Scale: External Consistency

Group:		*n*	$\overline{X}$	*s*	*F*	*df*	*p*	0	1	2	3
unsuccessful cases	0	8	2.53	.28							
successful cases	1	9	3.81	.22				*			
satisfactory projects	2	5	3.13	.31							
high performance projects	3	9	3.56	.15				*			
			3.29	.16	6.04	3, 27	.003				

Scale: Cost-benefit Analysis

Group:		*n*	$\overline{X}$	*s*	*F*	*df*	*p*	0	1	2	3
unsuccessful cases	0	8	1.31	.28							
successful cases	1	9	2.39	.22							
satisfactory projects	2	5	4.07	.31				*	*		
high performance projects	3	9	2.96	.15				*	*		
			2.96	.16	18.05	3, 27	.000				

Scale: Effects

Group:		*n*	$\overline{X}$	*s*	*F*	*df*	*p*	0	1	2	3
unsuccessful cases	0	8	2.20	.39							
successful cases	1	9	3.87	.48				*		*	
satisfactory projects	2	5	3.31	.19				*			
high performance projects	3	9	3.75	.13				*			
			3.31	.76	41.02	3, 27	.000				

(*) denotes pairs of groups significantly different at $p < .10$ level, according to the Scheffé procedure.

APPENDIX XII: Instructions for Assessing Effects (Cases)

Reconstruction of Results (Attained Curriculum)

The degree of resemblance between the attained curriculum and the ideal curriculum reveals the quality of the educational programme.

The ideal curriculum describes:

- how the educational programme furthers the acquisition of new skills,
- how these skills affect the work environment,
- how the changed work environment has an impact on the organization that leads to the achievement of the original objective as well as the solution of the original problem.

In this investigation, managers, developers, trainers, supervisors, and staff (trainees) give their opinions of the attained curriculum. These opinions help reconstruct the educational programme's results. Analysis and coding will prepare these opinions for further study.

Try to assign scores of 1, 2, 3, 4, or 5 to the opinions of managers, developers, trainers, supervisors, and staff according to the following guidelines:

1 = the programme has **not led to any** new skills or changes in the work environment and has not had an impact on the organization.

2 = the programme has led to **few** new skills or changes in the work environment and has had a minor impact on the organization.

3 = the programme has led to **some** new skills and changes in the work environment and has had some impact on the organization.

4 = the programme has led to new skills and changes in the work environment and has had a great impact on the organization.

5 = the programme has led to **very many** new skills and changes in the work environment and has had a tremendous impact on the organization.

Compare your scores to those of colleagues who have evaluated the same opinions. Try to equalise the scores through discussion.

APPENDIX XIII:
Related Items in Data Collection and Processing Instruments

Item:	Data collection protocol **Cases** Appendix I	Display **Cases** Appendix III	Assessment manual **Projects** Appendix VII
Systematic approach: adequacy of:			
needs assessment	C.1.1.2; 1.1.3; 1.1.4; 1.1.5	III,1	1A
goals	C.1.2.1	III,2	2A
task analysis	C.1.3.1; 1.3.4; 1.3.5; 1.3.6	III,3	3A
instructional objectives	C.1.4.1; C.1.4.2	III,4	4A
evaluation criteria	C.1.5.1; 1.5.2; 1.5.3; 1.5.4	III,5	5A
evaluation instruments	C.1.5.1; 1.5.2; 1.5.3; 1.5.4	III,6	6A
learning situations	C.1.6.1; 1.6.2	III,7	7A
course materials	C.1.6.3; 1.6.4; 1.6.5; 1.7.1; 1.7.2; 1.7.3	III,8	8A
Internal consistency: preceding elements are consistent with:			
goals	C.1.2.2	IV	2C
task analysis	C.1.3.3	IV	3C
instructional objectives	C.1.4.5; 1.4.6	IV	4C
evaluation criteria	C.1.5.2.1; 1.5.3.1; 1.5.4.1	IV	5C
evaluation instruments	C.1.5.2.1; 1.5.3.1; 1.5.4.1	IV	6C
learning situations	C.1.6.1.1; 1.6.2.1	IV	7C
course materials	C.1.6.3.1; 1.6.4.1; 1.6.5.1	IV	8C

Item:	Data collection protocol **Cases** Appendix I	Display **Cases** Appendix III	Assessment manual **Projects** Appendix VII
Relational approach:			
needs assessment	D.1.8; 2.8; 3.8; 4.8;	II; III,1	1A
task analysis	D.1.8; 2.8; 3.8; .4.8	II; III,3	3A
favourable conditions	E.3; 4	III,9	9A
selection of trainers	D.5.16	III,10	10A
selection of trainees	D.5.3; 5.4	III,11	11A
project management	--	--	16
involvement of line managers	D.1.8; 2.8.2; 3.8.3; 4.8.2; 5.9	VI,1	17
learning vs work situation	D.5.14; 5.15	VI,2	18
trainer's experience	D.5.16	VI,3	19
Cost-benefit analysis	C.1.19	V	15
External consistency:			App. VIII: Questionnaire:
the problem	D.1.1; 1.2; 1.4; 2.1; 2.2; 2.4; 3.1; 3.2; 3.4; 4.1; 4.2; 4.4; 5.1; 5.4;	I	1
skills needed	D.1.1.1; 1.3; 2.1.1; 2.3; 3.1.1; 3.3; 4.1.1; 4.3; 5.4;	I	4
Effects	D.1.1.2; 1.1.9; 1.11; 1.14; 2.1.2; 2.1.9; 2.11; 2.14; 3.1.2; 3.1.9; 3.11; 3.14; 4.1.2; 4.1.9; 4.11; 4.14; 5.2; 5.5; 5.12;	VII	2; 5; 6; 7; 9;

APPENDIX XIV: WITHIN-SITE DISPLAYS: CASE 02

Case 2: **Display I: Consistency between perceptions of the initial problem**

Manager	The department has an unbalanced level of expertise (outcome) Existing training was too theoretical, no focus on trouble shooting skills. (Non training component: improve mobility of employees)
Developer	More systematic work approach (outcome) Quality assurance system requires training (output) No problems as regards the performance of employees (outcome)
Trainer	Existing training was too theoretical (process) Existing training leads automatically to increase in salary (outcome)
Supervisor	Better informed employees are more involved in the work process (outcome)
Employee	To keep up with necessary level of knowledge (product)
Data Collector	Dissatisfaction with existing training (Process). No relationship with the job in the workshop, too theoretical (product and outcome)

Conclusions:

There is no direct performance problem, except for the need for a more systematic approach in the workplace (manager) and an increase of involvement of employees (supervisor).
Problems are stated in terms of outcome (relationship with the job in the workplace) and in terms of processes (the existing training was too theoretical).
The quality assurance system requires training in spite of the existence of a training need.

Case 2: **Display II: Actors' Involvement**

Actor	Development	Implementation
Manager	intensive	continuously informed
Developer	intensive	yes
Trainer = Supervisor	intensive	yes
Employee	no	yes
Other	subject matter experts. colleagues in the workplace. support for art work.	colleagues assist in on the job training.

Conclusions:

All actors are intensively involved in the development and implementation of the training programme.

Supervisors are main instructors and trainers.

Colleagues assist in on the job training and in testing the practical skills of the trainees.

Case 2: **Display III: Programme Development**

1. T.N.A*	Quasi need: better integration theory and practice. External need: improvement of a systematic approach in the workplace.
2. G.O	To install and test components. To locate defects in a systematic way.
3. T.A.	No task analysis report. Interviews and observations took place.
4. I.O.	Instructional objectives in terms of reproductive skills. No productive skills.
5. E.C.	Evaluation criteria: - shorter maintenance periods (output) - a more systematic approach (output) - fewer repairs in between scheduled maintenance (outcome) - fewer rejected products (output) - a more satisfied customer (outcome)
6. E.I.	Tests in classroom (product) Assessment in the workplace, Proof of qualifications (output)
7. L.S.	Detailed instruction plan: for both theory and practical work. Supervisor is trainer for both theory and practical work. Colleagues in the workplace are instructors. Learning situation resembles work situation.
8. T.M.	Elaborate training materials: exercises, handouts, tests, demonstration materials. Guidelines for trainers and instructors.
9. F.C.I.	No special activities for creating favourable conditions for implementation.
10. S.T.	Supervisors and on the job instructors attended a train the trainer programme.
11. S.E.T.	Supervisor selects the employees to attend the programme.
12. C.T.P.	Programme is carried out according to the lesson plans: 2 to 3 employees are trained by their supervisor in a classroom situation. The practical training takes place in the workshop by job instructors. A subject matter expert leads final assessment.

* See Appendix II: Coding Scheme.

13. S.E. No formal evaluation yet. However there are indications: better results, fewer rejected products, a more systematic approach by the employees, fewer breakdowns in between maintenance checks, better communication in dealing with problems, increasing commitment of employees.

14. I.E. No formal evaluation on impact yet. (see indicators at Short term evaluation: 13. S.E.)

Conclusions:

There is no systematic report on training needs assessment and task analysis. The objectives are carefully stated.

The evaluation criteria are not formally described, but there is a clear understanding of the desired outputs and outcomes.
Curriculum elements such as objectives, content, materials, activities, strategies, evaluation, grouping, time and space are clearly documented.

The supervisor plays a central role in the programme: he is the main trainer, selects trainees and coaches on the job training.

Although programme evaluation has not taken place yet, there are indicators that the programme already achieves some of its goals.
The direct training results are tested by an assessment of the desired qualifications in the workplace.

Case 2: **Display IV: Consistency between Assignment, Objectives, Evaluation, Learning Situations and Training Materials**

Assignment
Develop a programme that increases the systematic approach of installing and testing of components.
Theory and practice should be integrated.

Objectives
The objectives are stated in terms of reproductive knowledge and reproductive skills.

Evaluation Criteria
Indicators for criteria are:
- longer periods in between maintenance checks
- fewer repairs
- fewer rejected products
- customer satisfaction

Evaluation Instruments
- reaction: process evaluation for each training unit
- learning results: tests with items for knowledge and skills
- performance: assessment of qualifications by subject matter expert
- impact on organization: no instruments

Learning Situations
Detailed plan for instruction
Small groups of 2 or 3 trainees
Both classroom instruction and on the job instruction
Learning situation resembles work situation

Training Materials
Elaborate training materials support the objectives and the learning situations. There are materials, demonstration equipment and textbooks, for classroom training and for on the job training.
Practical guidelines for trainers and on the job instructors.

Conclusions
There is a strong consistency between objectives, tests, learning situations, and training materials.
The assignment reflects dissatisfaction with the existing training programme rather than a clear view of a desired performance level or organizational outcomes.
The reconstruction of the evaluation criteria shows that actors have clear ideas on intended performance improvement and organizational outcomes.
Although official programme evaluation has not taken place yet, indicators are at hand that performance is indeed improving.

Case 2: **Display V: Cost-Benefit Analysis**

Direct Costs	cost of development cost of implementation salary developer salary trainers
Employee sal.	salaries
Overhead Cost	no
Lost Opportunity	no
Benefits	no (indicators for improvement are not estimated as benefits)

Conclusions:
Direct and salary cost of development and implementation have been calculated.

Case 2: Display VI: Line Management Involvement, Learning Situation and Practical Experience of the Trainer.

1.	Involvement of line manager	supervisor developed training supervisor selects trainees supervisor is trainer supervisor assesses newly acquired skills on the job
2.	Learning situation resembles the workplace	workplace is main learning site classroom activities are regarded as preparation for the workplace activities most assignments are carried out in the workplace
3.	Practical experience of the trainer	supervisor is trainer the trainer has extensive practical experience on the job instructors are experienced colleagues

Conclusions:

Involvement of line management is very strong.
The learning situation and workplace look alike.
The trainers and instructors are supervisors and experienced colleagues who attended train the trainer programmes.

Case 2: Display VII: Perceived Effects

(The full text is included in Cross-Site Display VII of Appendix III)

CURRICULUM VITAE

Joseph W. M. Kessels was born on August 19, 1952. He studied at the University of Amsterdam, where he specialised in adult education and organization behaviour and graduated in 1979.
Since 1977, Mr Kessels has been the managing partner in Kessels & Smit, a consulting firm that does most of its work in the field of corporate education.
In 1989, he became the director of the Foundation for Corporate Education and was awarded the 'Opleidingsonderscheiding' of the NVvO, the Dutch Training and Development Association.