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A systematic and relational approach to obtaining curriculum consistency in corporate education

JOSEPH KESSELS and TJEERD PLOMP

[Abstract]

We report the results of an empirical study in the use of standards in designing educational programmes in corporate education that relates the programmes' constituent factors to their effects. Such standards may improve training products, affect goal-setting, remove constraints, and reinforce supportive activities. A conceptual framework on curriculum consistency provides the analytical basis for an exploratory first research phase. After the design strategies of 17 training programmes were analysed, a draft of design standards was prepared. In a second confirmatory phase, 28 instructional developers received training in applying the standards. Their products were evaluated as well as the effects of the resulting programmes in the various workplaces. This phase led to a revised version of the design standards. The implications of the research hypotheses are discussed as well as the extension of the findings to other educational contexts.

[End of abstract]

We report the results of a large empirical study in corporate education, conducted from 1989 to 1993 which attempted to develop design standards to improve the impact of corporate educational programmes. This research project is one of the few studies that tries to capture the results of the use of standards in designing educational programmes by relating their constituent factors to programme effects. In addition, professionals in this field are often searching for improvement in corporate education and are always in need of tested tools. Such tools should not only be directed towards high standard training products, but also have an impact on setting goals, removing constraints, reinforcing supportive activities, and avoiding transfer barriers.

First, we offer a conceptual framework on curriculum consistency derived from a literature review. That framework describes the problem under study, states the research questions and offers the analytical basis for an exploratory research phase. Then the exploratory research is reported. After 17 existing training programmes had been analysed for the design strategy followed in relation to their outcomes, a draft of design standards was prepared. Those standards attempt to generate a formal curriculum, i.e., a training programme, that will provide an appropriate solution to a specific problem in an organization. The standards comprise three guidelines on design steps, project management, and cost-benefit analysis. During a confirmatory research phase, a set of hypotheses about the effects of the design standards was formulated. A group of 28 instructional developers received training in applying the design standards. Their products were evaluated as well as the effects of the resulting programmes in the various workplaces. This phase led to a revised version of the design standards. Finally, we

examine the implications of the research hypotheses and the extent to which the main research questions have been answered. We also discuss whether the research findings may be generalized to a wider context than corporate education.

A conceptual framework on curriculum consistency

Training and development activities absorb a significant part of an organization's manpower capacity, budget, and opportunities (Harrison 1992). At present, knowledge development and learning are widely recognized as a major vehicle for organizational survival and change, and great interest is being shown in such concepts as 'learning to learn', 'organizational learning', and the 'learning company' (Senge 1990, Pedler et al. 1991).

In corporate education, goal-oriented and cost-effective learning situations are not restricted to the typical classroom. An organization offers many learning opportunities, and the environment outside the classroom seems to play a dominant role in achieving the desired effects of intentionally organized learning (Kirkpatrick 1975, Robinson and Robinson 1989, Broad and Newstrom 1992).

Although descriptive theories on how learning is organized are available, prescriptive theories and their related design instructions are scarce (Reigeluth 1983). Existing design standards for corporate education (Tracey 1971, 1984, Romiszowski 1981, 1984, Rothwell and Kazanas 1992) focus primarily on the acquisition of skills sustained by the work environment, skills that should bring about intended changes in employee performance and have an impact on the organization. The body of knowledge on formal education only provides a broad theoretical foundation for such design standards. Moreover, the complex mechanisms around corporate education, where the cognitive operations of individual learning intertwine with the social processes of an organization, demand not just an adapted theory but an extended theory that seeks to explain the successes and failures of an existing training systems and predicts the results of new actions. However, a study of curriculum design in this context should avoid the immodesty of presenting a grand theory that pretends to solve all problems in the field. Nor can it examine in any depth trainer behaviour and such trainee background variables as age, gender, intelligence, culture and previous education.

Corporate education provides intentionally designed learning situations aimed at both individual and organizational behaviour. Therefore, the required curriculum-design theory should not only incorporate indicators for developing curriculum materials, but also prescribe approaches to the strategic issues of an organization, to structural feedback mechanisms, and to the design of a work environment that inherently holds constructive educational values.

Research questions

The aim of this study was to develop a prescriptive theory and validated design standards for curriculum design in corporate education; it explores the following questions:

(1) Which factors in curriculum design influence quality in corporate education?

(2) How do these factors operate?

(3) Is it possible to draw up a set of curriculum-design standards that can control these factors?

<u>Curriculum consistency</u>

In the context of corporate education, curriculum is defined as the course of action open to an organization for influencing the skills that contribute to goal-oriented changes in employees' performance and the work environment. It attempts to make an impact on the organization by applying planned learning activities and the resulting learning processes. In corporate education many stakeholders (such as trainees, managers, supervisors of trainees, trainers and developers) have an interest in ensuring that the planned curriculum is of high quality. Each of them will have his or her own perspective on, and stake in, the curriculum that needs to be developed. The <u>quality</u> of a corporate curriculum can be defined as the degree to which such a curriculum meets the expectations of all relevant stakeholders. The <u>consistency</u> between the judgments of the different stakeholders about whether a curriculum meets all these expectations will be considered an expression of the quality of a curriculum.

Goodlad's curriculum typology (Goodlad <u>et al.</u> 1979) and the adaptation of this typology developed by Van den Akker (1988) provide a springboard for characterizing the curriculum perspectives of the respective stakeholders in corporate education. A modified version of
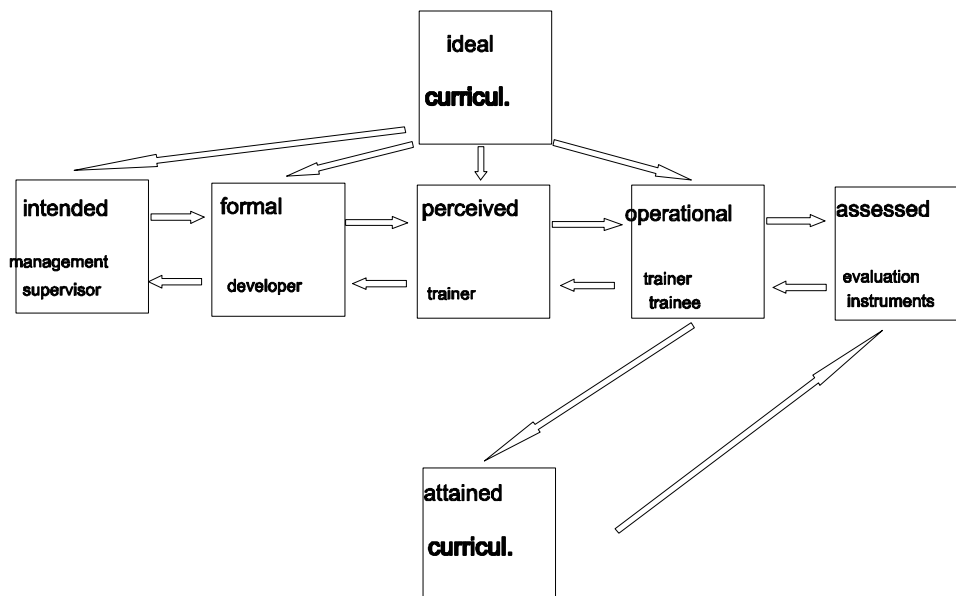

Figure 1: A curriculum typology for corporate education

Goodlad's curriculum typology is presented in figure 1. The arrows indicate the mutual influences of the related curriculum perspectives or appearances described in the following sections. The typology distinguishes between two forms of curricula:

> • the ideal curriculum: what should be strived for, and
> • the attained curriculum: what has been achieved.

The following intermediate appearances of a curriculum bridge the ideal and the attained curriculum:

> • the intended curriculum: the assignment from management to develop and conduct training;
>
> • the formal curriculum: the codified and documented design of the interventions needed (including all learning and instructional materials);
>
> • the perceived curriculum: the trainer's perception of what kind of education is needed;
>
> • the operational curriculum: the learning environment as it is observed in reality; and
>
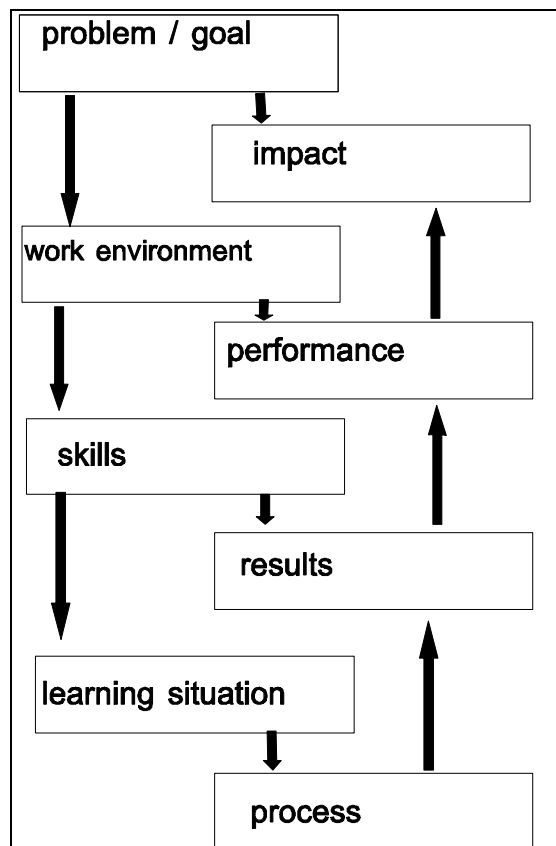> • the assessed curriculum: the evaluation of results.

Figure 2: Internal curriculum consistency 4

Defining the quality of a curriculum in terms of the degree of consistency between the respective curriculum appearances demands that emphasis be given to the consistencies between the subsequent curriculum appearances. In this context it is useful to distinguish between external and internal consistency.

External consistency refers to the congruence in the perceptions of the curriculum by the various stakeholders in a corporate education programme: (top) management, developer, supervisors, trainer and trainees. External consistency refers to the homogeneity of ideas and perceptions among these actors on the nature of the problem and its possible solution through an educational provision. Establishing such a coherence depends on the activities of the developer and is encouraged by a positive learning climate and an active corporate education policy.

Next to the need for consistency among the actors' perceptions, a curriculum should be consistent in itself. This concept of internal consistency applies to the logical contingencies between the elements of a curriculum (see figure 2):

- the changes needed in the work environment (where a problem is experienced);
- the necessary skills of managers or employees to bring about these changes; and
- the learning situations that encourage the acquisition of these skills.

By the same token, internal consistency also implies that the learning processes should enable employees to acquire skills (as results of the learning process) that influence their performance so that the affected work environment has an impact on the organization. The initial problem and the desired impact of the programme are closely related. The changes needed in the work environment form the criteria for an evaluation of performance improvement. The objectives in terms of skills and competencies form the criteria for evaluating direct learning results (see figure 2).

The concept of curriculum consistency – the logic connections [**contingencies (??????
Note previous query)]** between the curricular elements and the congruencies between its appearances – is inspired by Stake's (1973) model for curriculum evaluation. Throughout this study, curriculum consistency, both internal and external, is used as a descriptive framework for quality in corporate education.

Design approaches

The main purpose of developing and applying design standards is to improve the internal consistency of a curriculum and to work towards a strong external consistency between the curriculum perceptions of the actors in corporate education. When design standards are to influence curriculum consistency, the question arises as to what mechanisms can bring about internal and external consistency. By definition internal consistency of curricular elements refers to systems thinking, whereas external consistency of perceptions of actors requires social integration.
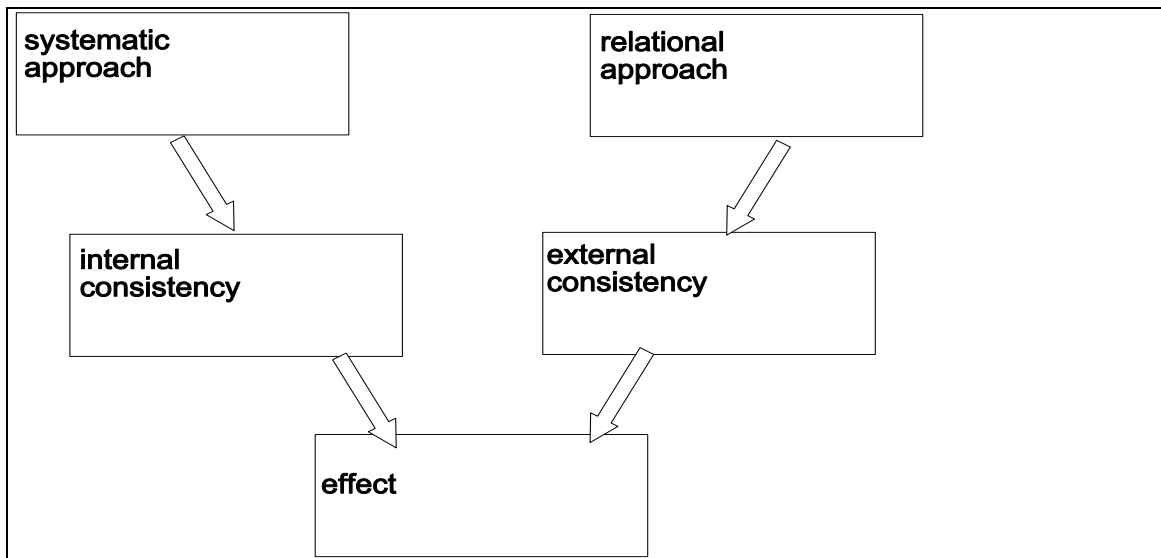
Figure 3: The systematic and relational approach

The theory developed here suggests that a match of a systematic approach (resulting in internal consistency) and a relational approach (aiming at external consistency) triggers a powerful combination of systems thinking and social integration. It is hypothesized that the integration of a systematic and a relational approach in design standards is responsible for curriculum consistency and subsequently for corporate education of a high standard (see figure 3).

Systematic approach

The systematic approach is well known in the literature; it implies the logical design sequence of orientation, design, development, implementation and evaluation (Tracey 1971, 1984, Romiszowski 1981, 1984, Plomp 1982, 1992, Branson and Grow 1987, Rothwell and Kazanas 1992). Specific instruments and methods used are needs assessment and job/task analysis techniques, instructional objectives, training strategies, training materials, guidelines for trainers and evaluation instruments. The systematic approach, when skilfully applied, leads to a well structured and logically ordered curriculum design with a strong internal consistency. This design on paper is referred to as the formal curriculum. [1]   To accomplish a systematic

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[1] The skilful application of these instruments requires specific competencies. Both the American Society for Training and Development (ASTD) (McLagan 1983, 1989) and the International Board of Standards for Training, Performance and Instruction (IBSTPI) (Foshay et al. 1986) conducted large-scale research projects on design and development competencies in corporate settings. The ASTD reports outline 11 roles, their outputs, the required competencies and related ethical issues. The IBSTPI standards describe 16 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 16 IBSTPI instructional design competencies, and claim to offer the first volume grounded on an underlying foundation of solid research. Tracey (1981) developed a 600-page self-evaluation manual for human resource development (HRD) managers and specialists. Part five of this giant checklist is devoted to the development, implementation and evaluation of HRD delivery systems.

approach in curriculum design in the context of corporate education, we selected competencies from the above-mentioned sources. This selection is justified by the requirements of an adequate performance of the elements in figure 2:

- Conduct <u>needs assessment</u>. Identify ideal and actual performance and performance conditions and determine causes of discrepancies. Employ strategies for analysing individual and organization behaviour (Problem/Goal, desired impact).

- Perform <u>job and task analysis</u>. Employ analysis strategies and reporting procedures (Work environment, desired performance).

- State <u>instructional objectives</u>. Transform job requirements into objectives, so that performance measurement and selection of instructional strategies is encouraged (skills).

- Develop <u>performance measurements</u>. Transform needs, performance requirements and objectives into evaluation criteria and appropriate assessment instruments (results and performance).

- Sequence the performance objectives. Draw a blueprint for the desired <u>learning environment</u>, appropriate for achieving the desired changes of performance (learning situation and process).

- Specify the <u>instructional strategies</u>. Devise instructional interventions to put the blueprint learning environment into action (learning situation and process).

- Design <u>instructional material</u>. Develop print, audio-visual or electronic-based learner materials, job aids, trainer guides and plans to encourage instructional interventions (learning situation and process).

- <u>Evaluate</u> the educational interventions. Appraise the instructional methods, sequences and materials, and improve (process).

- <u>Assess</u> results, performance improvement and the related impact on the organization (results, performance, imapct).

<u>Relational approach</u>

The relational approach provides activities that not only challenge actors or stakeholders to become involved in the design and implementation process but also reveal their perceptions of the curriculum. <u>When the stakeholders' mutual perceptions are explicit, they can be influenced and gradually become compatible</u>. The relational approach aims at stakeholders' involvement in the design and implementation process, and should have an impact on the management's commitment to corporate education. When skilfully applied, the relational approach leads to a strong external consistency among stakeholders' perceptions of the curriculum, a necessary

condition for a successful implementation of the new curriculum and for its presupposed effects.

The quality of the relational approach is heavily dependent on the personal effectiveness of the developer. Interpersonal and consulting skills seem to be indispensable for an effective relational approach. Management's acceptance of the developer, and the extent to which management legitimates the developer's role, are essential for problem-solving (Lippitt and Lippitt 1986). However, the image of the training function and its position in an organization's structure are the foremost conditions that determine the opportunities for a relational approach within a single project (Buckley and Caple 1990).

Many sources offer analyses of the competencies professionals should demonstrate when they enter into the relational approach. Often the performance-oriented corporate educator is portrayed as a 'change agent' (Phillips and Shaw 1989, Clark 1991, Pont 1996). The profile of the change agent in the planned-change tradition may be of great value for the developer in curriculum design (Lippitt et al. 1958, Bennis et al. 1969, Argyris 1982).

The ASTD research projects (McLagan 1983, 1989), as well the IBSTPI standards (Foshay et al. 1986), define several competencies for developers that we consider part of the relational approach. Furthermore, the literature on consulting and coaching offers a variety of requirements and competencies for developers to adopt in their relational approach (Block 1981, Lippitt and Lippitt 1986, Gilley and Eggland 1989, Phillips and Shaw 1989, Rothwell and Kazanas 1992, Sink 1992, Tosti and Jackson 1992). The most salient competencies, which should be considered in a training programme for curriculum developers, are:

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

- Project management skills: leadership and chairperson skills, planning, monitoring and negotiating skills.

- Consulting skills: building open collaborative relationships, clarifying mutual expectations and responsibilities, and the ability to influence others and gain commitment.

- Facilitating change: encouraging widespread participation in the design and implementation of a project, and dealing with friction and resistance.

- Experimental flexibility, self-insight and self-esteem.

- Ability to create an atmosphere of tact, trust, politeness, friendliness and stability.

A chain of reasoning

The chain of reasoning developed for this study consists of several components that are related

to each other on the basis of the assumptions in the curriculum consistency theory as well as the supporting systematic and relational approaches (see figure 4).
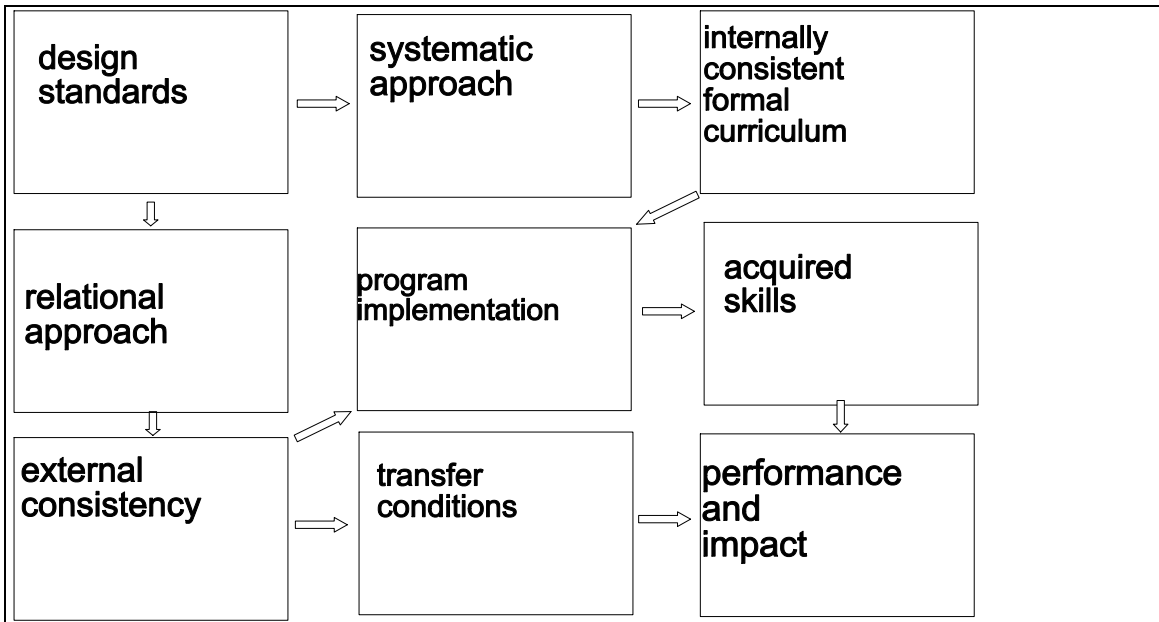

Figure 4: A chain of reasoning in corporate education

- Design standards, reflecting a combined systematic and relational approach, are used to prepare educational programmes (i.e. formal curricula) intended to bring about such positive effects as required skills, improved performance, and desired impact. These preparations result in such tools as plans, materials, and guides (design standards in figure 4).

- Effective design standards require skilful application by the developer, who needs to be trained to apply the design standards appropriately (including both a systematic and relational approach, the internally consistent formal curriculum and external consistency in figure 4).

- The desired effects are assumed to be attained after implementation of the programme by the trainer (programme implementation in figure 4).

- The effects of a programme find expression at first 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 the positive effects (see figure 2, and acquired skills, performance and impact in figure 4).

- Transfer of newly acquired skills into improved performance is encouraged or impeded by conditions in the participants' work environment (transfer conditions in figure 4).

The concept of curriculum consistency and the resulting chain of reasoning lead to the following hypotheses which were tested in the course of the study to be reported here:

> Hypothesis (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.

> Hypothesis (2): Design standards advocating a systematic approach lead to internally consistent formal curricula.

> Hypothesis (3): Internal consistency of the formal curriculum and programme effects are related positively.

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

> Hypothesis (5): External consistency and programme effects are related positively.

> Hypothesis (6): The relational approach compensates for weaknesses in the systematic approach.

> Hypothesis (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 desired effects at the lowest costs. As the largest cost-factor in corporate education is trainees' salaries and their opportunity-costs (the loss of potential contribution to the organization during the training), the programme with the shortest training time per employee is the least costly. But the shortest programme is not necessarily the most effective. Therefore, although 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:

> Hypothesis (8): Although cost-benefit analyses are important for selecting efficient solutions to educational problems, they are not related to programme effectiveness.

The Study
On the basis of the review of the literature, a first operationalization of the systematic and the relational approach was drawn up, as outlined above. The hypotheses as worded here were first tested in the exploratory research phase. In the next step these findings, combined with a literature review, resulted in a blueprint of the design standards as summarized in table 2. The application of this set of design standards was tested against the empirical findings in the

second phase of the research, consisting of 28 corporate curricula designed on the basis of the standards.

Exploratory research

The aim of the exploratory phase was to detect factors in the process of corporate curriculum design that affect the quality of the outcomes. For this purpose, two sets of contrasting cases were selected: nine successful and eight unsuccessful curricula. [2]

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 reason for the exclusion or inclusion of specific types of organizations, and the kind of programme did not matter. The only criterion was that the programme had to have been developed at the request of the organization. The course design could have been carried out by either the in-house training staff or an outside agency. (Given the research questions, off-the-shelf courses and packages were excluded.)

At the outset, the definition of success or failure was left to the training managers. We were mainly interested in the contrast between programmes considered successful or unsuccessful by the organizations themselves. During discussions with training managers, we soon learned that the main problem would be obtaining access to cases, especially unsuccessful ones. [3]These concerns were addressed by promising the participating organizations that the cases would be studied anonymously. These considerations led to the following selection process.

Fifty training managers, were invited to offer two contrasting training programmes: one successful and one unsuccessful. To avoid insulting anyone, the label 'less successful' was used. Fourteen managers responded that their organizations were willing to participate in the project (28 cases). However, when the time came to submit the cases for analysis, only nine 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.

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[2] This phase of the project may be characterized as a multiple-case study with multiple units of analysis, focusing on theoretical replication and not at statistical generalization, described by Yin (1989) as a Type 4 study. The within-site and cross-site data analyses were carried out by means of display techniques described by Miles and Huberman (1984). As use has been made of 17 existing, already implemented curricula, the research design may also be considered a post facto design (Sprinthall et al. 1991: 71).

[3] In general, managers were reluctant to offer failures for outside inspection. Furthermore, the research design called for the co-operation of developers, trainers, managers, supervisors and trainees. Publicly designating their programme as unsuccessful would make them reluctant to participate and inhibit a collaborative attitude.

Nine successful and nine unsuccessful cases were examined. However, 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 an organization's specific need and included the following types of programmes: technical skills (cases 1, 2, 11, 12); interpersonal skills (cases 3, 4, 7, 8); computer skills (cases 5, 9, 10, 13, 14); servicing skills (6, 15, 16); and management skills (case 18). The participating organizations covered the field of banking, insurance, public service, industry, transportation, and consulting. The cases have been selected by the local training managers on 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'.

Data collection Data were collected about how the curricula (programmes) were designed and implemented, i.e. the extent to which a systematic and a relational approach was followed. Data were collected by analysing programme documents and by interviewing stakeholders such as (top) managers, supervisors, developers, trainers and trainees. Eight trained investigators were involved in the data collection and used a data-collection protocol that contained detailed guidelines. [4] The protocol covered the following area:

- general information on the case;
- guidelines for the study of documents;
- guidelines for interviews with the stakeholders: (top) management, supervisors, developers, trainers, students; and
- a framework for writing a case report.

Data reduction was accomplished by applying coding and display techniques described by Miles and Huberman (1984).

The qualitative analysis was complemented by a quantitative analysis in which successful and less successful cases were contrasted. A separate group of eight analysts not involved in the data collection rated the items of the main variables on a five-point scale, so that (Likert-) scales could be constructed for the following variables: systematic approach, internal consistency, relational approach, external consistency, cost-benefit analysis, and effect. Values below 3.00 were defined as low. In the quantitative analysis, data were rejected when jury inter-rater reliabilities were less than .60 and scale reliabilities less than .70. The probability level ($p < .10$) is justified by the small number of cases.

The effect variable The initial operationalization of the effect variable was left to the local training managers who subjectively labelled each programme as either 'successful' or 'unsuccessful'. To be able to address the research questions, it was necessary to operationalize the effect variable in a more objective way. First, statements about the effect of a programme were collected from programme documents and interviews with stakeholders. Statements

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[4] These guidelines were derived from the variables and their constituting items, e.g. activities in the context of needs analysis, task analyses, instructional objectives, evaluation criteria and instruments, instructional strategies and materials, selection of trainees, and trainers, project management and gaining support.

referred to reactions of trainees, test results, changes in performance of trainees and effects on the department or organization (see categories in figure 2). Second, the effect variable was quantified in two independent rating sessions. In the first session two judges (expert training consultants) assessed the stakeholders' statements on the perceived effects by rating those statements on a five-point scale (1 = no effect; 5 = highly effective). [5] In the second session the same rating process was repeated with different judges.

Comparison of the two rating series showed a correlation (r) of .85. On the basis of the mean of the two ratings a Likert scale for the effect variable was constructed. The resulting effect score allows for re-labelling of the cases: a case is now being labelled 'unsuccessful' when the effect score was less than 3.00, and labelled 'successful' with an effect score of 3.00 or more. The ratings of the perceived effects of the 17 cases made it possible to rank the cases according to their new total scores. [6] The results are summarized in table 1. This effect scale could also be used to calculate the correlations of the following variables: systematic approach, internal consistency, relational approach, external consistency, cost-benefit analysis, and effect.

Results of the exploratory research

This section formulates preliminary answers to the research questions in the context of the theory developed in the conceptual framework. To that end, the main variables and their constituent elements will be discussed, and the hypotheses confronted with the findings.

The results of the process of data reduction are summarized in table 1. To visualize the differences between the two sets of contrasting cases, the data are depicted in graphical form. The cases are ranked according to their effect value. We offer a summary of the main results. [7]

Table: I: Display of case scores in a graphic pattern, ranked according to the Effect value.

Case	Systema-tic Approach	Internal Consist.	Relational Approach	External Consist.	Cost-Benefit Analysis	Effect
12	###	####	####	###	###	####

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[5] The rating took place according to prescribed instructions. When all cases had been rated, the two judges compared their ratings, discussed differences and reached consensus. This discussion was considered necessary because the quality of the statements of the stakeholders varied considerably.

[6] When the cases' scores were tied, we broke ties by using the combined ratings of managers and supervisors as a second ranking key.

[7] A full description of the process of data reduction and the results from the data analysis in the exploratory phase is presented in Kessels (1993),

11	###	####	####	####	#	####
18*	####	###	###	####	###	####
2	####	###	####	###	###	####
8*	##	#	###	##	#	###
10*	##	##	####	####	#	###
16	####	###	####	###	####	###
14*	##	###	####	###	##	###
6*	##	#	###	####	#	###
15	##	##	##	##	##	##
7*	#	#	#	##	#	##
13*	#	#	#	###	#	##
4*	##	#	#	#	#	##
3*	#	#	#	##	#	##
9*	##	##	#	###	#	##
1*	##	##	#	#	###	#
5	##	##	#	##	#	#

Odd numbers denote the cases that were originally labeled unsuccessful.
Even numbers denote the cases that were originally labeled successful.

(*) denotes that developer and trainer are one and the same person.
(#) denotes value   1 #   <2
(##) denotes value   2 ##   <3
(###) denotes value   3 ###   <4
(####) denotes value   4 ####   5

       The following observations are made on the basis of the values of the main variables and the statistical comparison of successful and unsuccessful cases, combined with additional qualitative information. As the 17 cases included nine successful and eight unsuccessful cases, the post hoc tests ranked the most effective programmes above the least effective. Even-numbered cases (indicated by the training managers as being successful) are clearly ranked above the odd-numbered cases, except for Case 11, which is ranked among the most effective, and Case 4, which is ranked among the least effective. [8]

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[8] We contacted the two training managers who submitted Cases 4 and 11 and informed them of the discrepancies. The training managers gave the following Case 4: Upon hearing the findings of Case 4, the training manager acknowl-

In unsuccessful cases (effect < 3.00) a significantly poorer systematic approach is applied than in the successful cases (effect ≥ 3.00) ($\underline{t}$ (12.14) = -3.18, $\underline{p}$ = .008). However, in most cases, whether successful or unsuccessful, documentation on the design and development process is poor.

Some of the conclusions that emerged are:

• Reports on training needs assessment and task analysis were mostly absent in both types of cases;

• Instructional objectives of unsuccessful programmes tended to be stated in terms of reproductive knowledge;

• Instructional objectives of successful programmes tended to be stated in terms of a combination of reproductive as well as productive skills;

In both types of cases, evaluation criteria were neither stated nor documented;

• In both types of cases, evaluation instruments were 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 in the work environment or organizational impact;

• In the successful cases, the designed learning situations showed 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

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edged 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, on 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 the practical sessions were prepared and debriefed. 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 thought they had failed and subsequently labelled their programme as unsuccessful.

Unsuccessful cases had significantly poorer internal consistency between the assignment, objectives, evaluation, learning situations, and training materials than did the successful cases ($\underline{t}$ (11.39) = -3.64, $\underline{p}$ = .004).

Relational approach

Unsuccessful cases applied a significantly poorer relational approach than the successful cases ($\underline{t}$ (15) = -9.38, $\underline{p}$ < .001). Drawing on the
qualitative data the following conclusions can be drawn:

- Actors' involvement during development and implementation was strong in successful programmes. The successful cases showed strong involvement by line managers in particular. The unsuccessful cases did not.

- The similarity between learning situations and work environment was extremely strong for the successful cases and weak for the unsuccessful cases.

- Practical experience of the trainer in the subject-matter field was extensive in the successful cases and limited in the unsuccessful cases.

- In six of the nine successful cases special emphasis was put on creating favourable circumstances for implementation. None of the unsuccessful cases emphasized this aspect.

External consistency

In the unsuccessful cases, consistency between actors' perceptions of the initial problem at hand was significantly weaker than in the successful cases ($\underline{t}$ (15) = -3.56, $\underline{p}$ = .003).

Cost-benefit analysis

In general cost-benefit analysis was given little attention. Still, unsuccessful and successful cases differed significantly ($\underline{t}$ (11.57) = -1.91, $\underline{p}$ = .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 and another case provided an estimation of lost opportunity-costs. Only one case contained an estimation of benefits.

Findings of the exploratory research related to the hypotheses

To relate the findings to the hypotheses, relevant correlations between variables have been computed. On the basis of these findings, the hypotheses are examined and discussed in relation to the conceptual framework previously outlined (see figures 3 and 4). The probability level $\underline{p}$ < .10 is justified by the small number of cases.

Hypothesis (1): A systematic approach leads to internally consistent curricula.

A significant correlation was found (r = .87, p < .001). None of the cases reveal a high value for systematic approach together with low internal consistency (see table 1). This hypothesis should not be rejected.

Hypothesis (2): <u>The internal consistency of the formal curriculum and programme effects are related positively.</u>

A significant correlation was found (r = .77, p < .001). This hypothesis should not be rejected. Deviations appear in Cases 8, 10 and 6 (see table 1) which reflect low values for internal consistency (< 3.00) but are nevertheless ranked among the successful cases. Apparently, low internal consistency does not affect programme effects in these cases.

Hypothesis (3): <u>A relational approach leads to external consistency</u>.

A significant correlation was found (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. Cases 13 and 9 (table 1) reveal that the relational approach is not a strict condition for external consistency.

Hypothesis (4): <u>External consistency and programme effects are related positively.</u>

A significant correlation was found (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 (see table 1). Further examination of the qualitative data on these cases revealed that both cases concern computer training. In Case 9 the developer/trainer was a management trainee 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 being used. The strong external consistency among senior management, local supervisors and the participants on the need for the programme, and its objectives could not compensate for the trainer's lack of subject-matter expertise.

Hypothesis (5): <u>The relational approach compensates for weaknesses in the systematic approach</u>.

Successful cases with a weak systematic approach (defined as < 3.00, i.e. Cases 8, 10, 14 and 6; see table 1) exhibited a relational approach ≥ 3.00. In these cases the high value for the relational approach seems to compensate for the low value of the systematic approach. 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 (≥ 3.00 [Case No. 8: 2.95]), might compensate for that weakness.

Hypothesis (6): <u>The systematic approach does not compensate for weaknesses in the relational approach</u>.

In the group of successful cases, none shows a relational score less than 3.00. In other words, there are no low values to be compensated for. In the unsuccessful group, Cases 4, 9, 1, and 5 show stronger systematic than relational approach, although the scores are below 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 ($\underline{r}$ = -.51, $\underline{p}$ = .096). This 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 about whether the relational approach alone is satisfactory 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 resulting in external consistency. This assumption would explain why successful programmes have benefited from the systematic approach (internal consistency × effect: $\underline{r}$ = .62, $\underline{p}$ = .037), whereas unsuccessful programmes have not (systematic approach × effect: $\underline{r}$ = -.51, $\underline{p}$ = .096).

Hypothesis (7): <u>Although cost-benefit analyses are important for selecting efficient solutions to educational problems, they are not related to effectiveness</u>.

No significant direct or reverse correlation was found for 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 and of trainee salary costs and their (lost) opportunity-costs in the light of the expected benefits directs decisions on instructional strategies, course length, selection of media, group size, and number of trainers. But in this study, cost-benefit analysis is treated as an independent variable, separate from the systematic approach, which apparently does not contribute to programme effectiveness.

<u>The trainer as developer?</u>

In an additional analysis 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 $\underline{t}$ tests. The two groups do not significantly differ on the effect variable ($\underline{t}$ (15) = -1.01, $\underline{p}$ = .328). This finding indicates that it is unlikely that a curriculum will be effective only when the trainer is also the developer. The two groups do not differ significantly either on the relational approach variable ($\underline{t}$ (15) = -1.74, $\underline{p}$ = .103), or on external consistency ($\underline{t}$ (15) = -.48, $\underline{p}$ = .641).

However, splitting the tasks of trainer and developer appears to affect the systematic approach ($\underline{t}$ (15) = -2.32, $\underline{p}$ = .035) and internal consistency ($\underline{t}$ (15) = -3.25, $\underline{p}$ = .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 an 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.

<div align="center">Confirmatory research</div>

The second phase of the research project consisted of the development of a blueprint for design standards based on the results of the exploratory phase, the training of 30 curriculum developers on how to apply these standards, the evaluation of their curriculum products and development process, and the effects of the resulting programmes in their work environment.

A blueprint for design standards

The results of the exploratory study suggest that developers can increase the effectiveness of their designs and the efficiency of the development process by adapting their models to the framework of the generic problem-solving model (table 2: left column), and by applying the elements of the relational and systematic approaches. In the blueprint for the design standards, the elements of the relational and systematic approaches were ordered and presented in the matrix of table 2. On the basis of this blueprint, two planning models were developed, both becoming part of the design standards: The Curriculum-Design Model (table 2: central column) and The Project Management Model (table 2: right column).

A curriculum development project needs to be coordinated and controlled. This management function is provided by the project management model, and assists in planning the development team and controlling the necessary resources. We outline a customized design model that reflects the logical structure of the systematic approach. The activities supporting the relational approach in the design model are marked with * in table 2. All these activities offer opportunities to discuss ideas, objectives, strategies, and favourable and inhibiting factors with the major stakeholders. [9]

Table II: A blueprint for design standards

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[9] The complete set of procedures for the project management model and the design model is described fully in Kessels (1993, 1996). The formats for these two models and their operating procedures are inspired by the texts of authors discussed above (e.g. Tracey 1971, 1984, Romiszowski 1981, 1984, Plomp 1982, 1992, Rothwell and Kazanas 1992). Romiszowski's analytical treatment of the heuristics in curriculum design supported the systematic approach. Rothwell and Kazanas' (1992) procedures in Mastering the Instructional Design Process, based on Instructional Design Competencies: The Standards (Foshay et al. 1986), provide valuable suggestions for both systematic and relational approaches. Notwithstanding our recommendation of spiral, iterative and cyclic procedures (Banathy 1987), the graphical representation of the models reflects a linear format, as the multitude of possible iterations and simultaneity would otherwise blur the desired clarity of the presentation.

Generic Model	Curriculum Design Model	Project Management Model
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 *
	4. Instructional Objectives	Instructional objectives
	5. Evaluation Criteria	Evaluation criteria
	6. Evaluation Instruments	Evaluation instruments
	7. Design Learning Situations	Design learning situations - educational format - instructional strategies
Construction	8. Select and Instruct Trainers *	Choose the project team members, such as trainers, coaches, and mentors *
	9. Develop Training Materials	Compile the course material
	10. Favorable Conditions * * for Implementation	Plan the execution * Instruct trainers and other members of the project team *
	11. Select Trainees * *	Select trainees *
Test & Revision	12. Conduct Training Program	Run a pilot program
	13. Evaluate Process & Results *	Evaluate the learning process * Evaluate the learning results * Adjust the learning situations
Implementation	14. Evaluate Performance and Impact *	Deliver the program Evaluate changes in the work

		environment *
		Assess the impact on the original problem *
		Adjust the design
		Take procedural measures
		Conclude the project *

* denotes that this activity supports the relational approach

Training of developers

The availability of design standards does not guarantee skilful application. The developer must put these procedures into action. Developers must master the design standards, and above all, be motivated to apply these procedures in their own organizations. To that end, 30 developers registered for a course on instructional development in which the objectives were geared towards the skilful application of the design standards. The course was taught to two groups of 15 participants, and took place over eight months during which participants devoted part of their time the development of a training programme (corporate curriculum) to be implemented in their organizations. [10]

The participants were training officers, human resource managers and training consultants working in corporate education. The criteria for enrolling in the programme were:

- the candidate's current position permitted professional curriculum design;
- the candidate had been assigned to develop an educational programme; and
- the candidate had a first degree from higher education.

The training programme consisted of 10 modules of two successive days each, distributed over eight months. The participants spent an additional two days per month on individual study. Course materials comprised the design standards (first version: a manual with detailed descriptions of the various design steps and guidelines for project management as indicated in the blueprint in table 2), selected readings, and assignments for practical work. The programme directors arranged separate meetings with the participants' mentors, in which they discussed the course objectives and characteristics, as well as the mentors' supportive role in helping to perform the activities of the relational and systematic approaches. The mentors were provided with documents on the design standards (a summary of the blueprint in table 2).

Evaluation design for curriculum projects

This second empirical study is both a replication of the preceding exploratory study and also an evaluation study of the design standards. To that end, the same hypotheses apply also to this part of the research. As the specific use of design standards is emphasized, Hypothesis (1) has been restated as follows:

Skilful application of design standards, based on both a systematic and a relational

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[10] The participants spent an average of five days per month on their project. As the main feature of the training programme was the combination of working on a project while being coached by two experienced developers (the trainers) and by individual mentors (supported by guest lecturers on specific topics), the training turned into a reflective practicum (Schön 1987).

The two programme directors (the first author was one) 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, two participants could not finish their projects because of illness.

approach, will generate educational programmes that accomplish significantly better results than those of unsuccessful programmes in the exploratory study.

Data collection

The data collection focused on curriculum documents such as reports of needs assessment, task analysis, objectives, evaluation criteria and instruments, programme planning, course material, cost-benefit analysis, guidelines for trainers, perceptions of the various stakeholders on the need for the programme, the procedures that were followed, and the effects. Data collection was conducted by 20 professional assessors using an assessment manual to determine the quality of the respective curriculum designs and by means of questionnaires for (top) managers, supervisors, developers, trainers, and trainees to obtain data on the perceptions of the initial problem and programme effects. [11] Data collection took place in three stages:

Stage 1: Assessment of curriculum design: systematic and relational approach, and internal consistency

(a) Three independent assessors per project studied the curriculum documents of 28 projects and carried out a preliminary analysis guided by the assessment manual.

(b) 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 their manuals and submitted them to the researchers. Items with jury scores of less than .60 were deleted.

Stage 2: Assessment of effects

(a) Four months later, the researchers sent out the questionnaires on effects to the top manager, the supervisor, the developer, the trainer, and to the trainees.

(b) Seven months after the questionnaires were sent out, the last set of data was returned to the researchers. Sets arriving after that date were not included in the analysis.

Effect was based on the stakeholders' responses (≥ .60) to the questionnaire asking about satisfaction (process), acquisition of skills (results), improved performance, impact on work environment and department, and impact on the organization (see figure 2).

Stage 3: Assessment of external consistency

For each project, three judges assessed the consistency between perceptions of the following stakeholders: managers, developers, trainers, supervisors and trainees. These

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[11] Three assessors piloted the assessment manual. These 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.

perceptions were derived from the answers to two specific questions in the questionnaires:

(a) What instigated the development of this educational programme?

(b) Which new skills should trainees acquire in this programme?

The judges assigned scores for the consistency between 10 pairs of actors (jury   .75).

Results of the confirmatory research

Questionnaires were returned for 17 projects. [12] The number of respondents per project varied from 1 to 12. The reliability of the effect measures was secured by applying the following criterion for accepting a project: at least 75% of the actors should show a jury score greater than .60 on the items of the effect variable. Three projects did not meet that criterion and had to be rejected. The correlations between variables are therefore based on the 14 remaining projects.

On the basis of the data from the assessment of the curriculum design, the questionnaires, and the external consistency judgements, Likert scales like those used in the exploratory study were constructed. Table 3 presents a summary of the scales. The scales for the systematic approach, internal consistency, relational approach and cost-benefit analysis variables are based on the data from 28 projects. The scale for the external consistency variable is based on the data from the 17 implemented projects. The scale for the effect variable is based on the 14 remaining implemented projects. [13]

Table III: Scale analysis in projects

Scale	n	*min.*	X	s	scale a
Systematic Approach	28	3.33	4.00	.46	.87
Internal Consistency	28	3.07	3.74	.52	.88

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[12] In Stage 1 of the data collection the assessors analysed the curriculum documents of 28 projects. However, in Stage 2 the questionnaires could be retrieved for only 17 projects. There were many reasons why 11 designed curricula were not implemented at the time of the data collection stage 2, e.g. reorganization, economical situation of the company, design process not yet finished, or insufficient organizational infrastructure for the curriculum designed.

[13] In that implementation had been postponed for 11 projects, experimental mortality might affect the findings. Therefore, we were interested in whether the values for the systematic approach, internal consistency and relational approach variables of 17 implemented projects differed significantly from those in the group of 11 postponed projects. For this comparison, t tests run for the two groups showed that for the three variables the 17 implemented projects did not deviate significantly from the 11 postponed projects ($p < .10$). Therefore, experimental mortality is not likely to affect the validity of the effect values at hand.

Relational Approach	28	3.58	3.85	.36	.89
External Consistency	17	2.33	3.25	.63	.75
Cost-Benefit Analysis	28	3.33	4.26	.46	jury a = .62 *
Effect	14	3.10	3.59	.26	.73

* As the Cost-Benefit variable is based on one item, its reliability is expressed
by the jury a of the three assessors.
Scale points: 1 = not at all adequate/consistent/effective
               2 = slightly adequate/consistent/effective
               3 = somewhat adequate/consistent/effective
               4 = very adequate/consistent/effective
               5 = highly adequate/consistent/effective

A general conclusion is that the projects show homogeneous values for the six variables (table 3). Only the external consistency variable is weak (< 3.00) for three projects. The cost-benefit analysis variable is very strong (> 4.00) for all but three projects. In terms of the effects variables, all the 14 projects can be judged successful using the same criterion for success applied in the exploratory study (> 3.00). [14]

Findings related to the hypotheses [15]

Hypothesis (1): <u>Design standards advocating a systematic approach lead to internally consistent formal curricula.</u>

As the correlation between systematic approach and internal consistency is r = .88, p < .001, this hypothesis should not be rejected. The exploratory study showed similar high correlations (r = .87, p < .001).

Hypothesis (2): <u>Internal consistency of the formal curriculum and programme effects are related</u>

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[14] This homogeneous achievement is rewarding to the group of developers and their organizations, but the limited variance in the data caused psychometric problems. Between relational approach and external consistency no substantial correlation could be established because of small variances (s = .36 respectively s = .63). This was also the case with the correlation between relational approach and effects (s = .36 respectively s = .26).
[15] Hypotheses (5): <u>the relational approach compensates for weaknesses in the systematic approach</u>, and (6): <u>the systematic approach does not compensate for weaknesses in the relational approach,</u> could not be tested because of a lack of empirical data. As the values for the systematic approach and for the relational approach are all > 3.00, none of the courses were labelled 'weak' on these variables.

positively.

The correlation between internal consistency and programme effects is r = .47, p = .043 and this hypothesis should not be rejected. It is noteworthy that the five projects with the lowest effect values (< 3.50) show a negative correlation (r = -.72, p = .086). These findings indicate that internal consistency and the related systematic approach probably have to be embedded in the prerequisite condition of external consistency to be effective. They also form a basis for a plausible explanation 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).

All the correlations found were close to zero and none were significant. This might indicate that, from a statistical perspective, the hypothesis should be rejected. Compared to the exploratory study, this shift is dramatic (exploratory study: relational approach × external consistency r = .54, p = .013; relational approach × effects r = .86, p < .001). [16] In view of the high values for external consistency in the first study and the small variance of the variables in the second study, rejection of the hypothesis is not justified.

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

As the correlation between external consistency and effects is r = .40, p = .077, this hypothesis should not be rejected.

Hypothesis (7): Although 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 programmes in the exploratory study.

The minimum value found for the systematic approach is 3.33. The minimum value for the

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[16] A plausible explanation for this deviant pattern is that, in view of the strong correlations found in the first study, 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 the second study. The deviant pattern may be of psychometric origin, namely that the variance of the relational approach is too small (s = .36) to obtain substantial correlations. Because of the design of the confirmatory study, the relational approach has been applied in all projects resulting in a ceiling effect.

relational approach is 3.58. These values justify the conclusion that in all projects of the second study the systematic approach as well as the relational approach have been skilfully applied. The programmes in the first study were not developed on the bases of the design standards that the developers in the second study applied. In the first study, the criterion for success is effect ≥ 3.00. All projects in the second study present effect values greater than 3.00. Assuming that it is appropriate to compare the effect values of the two studies, we conclude that skilful application of the design standards generates educational programmes that accomplish results significantly better than those of unsuccessful programmes in the exploratory study. This hypothesis should not be rejected.

Revised design standards

At the outset of the project the intention was to revise the design standards on the basis of the findings of the confirmatory study. In this second study, experts assessed the curriculum documents and rated 26 aspects (based on the blueprint in table 2) on a five-point scale (1 = highly inadequate/inconsistent, 5 = highly adequate/consistent). The criterion for revision was a score < 3.50. No items failed to meet this standard. The item with the lowest score (3.57) was the consistency aspect of the evaluation criteria (item 5 in table 2, note *)

Item 5 in table 2 comprised the following questions:
  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?

Furthermore, the developers were also asked to evaluate the design standards. In addition to enthusiastic responses, only some alterations on layout and sequencing were recommended. The revised version has adopted the developers' suggestions.

Discussion

In this section we review the general research questions set out at the beginning of the paper. We interpret the results of the study in terms of the conceptual framework.

(1) Which factors in curriculum design influence quality in corporate education?

We argued that the systematic and relational approaches of the developer are related to the internal and external consistency of a curriculum. Curriculum consistency is used as a descriptive framework for quality in corporate education.

       The argument has several corner-stones. A systematic approach generates logical connections between purpose, objectives, evaluation criteria and instruments, and the instruction presentation. The systematic approach results in 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. 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 stakeholders like (top) managers, supervisors, developer, trainers, and trainees share coherent opinions about the purpose of a programme and the strategy to follow, their efforts will lead to successful programme implementation, favourable transfer conditions and positive effects.

Our findings provide empirical evidence for the simultaneous application of the systematic and the relational approaches.

(2) How do these factors operate?

The systematic approach involves a logical and intellectual endeavour. The developer collects and analyses data on the desired outcome and the target group, 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 follow a systematic approach 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 by strategically applying gentle pushes and decisive pulls. The goal of these efforts is to achieve a consensus on the nature of the problem, on methods for 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.

(3) Is it possible to draw up a set of curriculum-design standards that can control these factors?

The developers who participated in the confirmatory 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 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. [17]

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[17] 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 in contrast with the exploratory study which showed very poor performance on this item. However, the cost-benefit analysis does not have a significant impact on programme

The procedures for systematic curriculum design were learned and adopted successfully by the developers 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.

In the framework of a single programme, a 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 in applying a relational approach will not automatically result in strong external consistency and consequently in effective programmes. It is obvious that, quite apart from the activities of a single programme developer, an organization will benefit most from the relational approach when the educational policy at the managerial level advocates corporate curriculum design that integrates the systematic and relational approaches. Thus, quality in corporate education is not solely dependent on skilful application of relational and systematic approaches of the developer, but on the organizational climate in which an integrated educational strategy can flourish.

In view of these 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 in the confirmatory study performed significantly better than the unsuccessful cases in the exploratory study as to effect, systematic approach, internal consistency, relational approach and cost-benefit analysis.

Generalization

The study was carried out in the context of corporate education, and in a limited setting of 31 programmes. This raises the question as to whether the findings also apply to curriculum development in formal education? Many of the aspects that we have dealt with are related to the implementation of educational programmes in the regular school system (Fullan 1982, 1989). However, the programmes investigated in this study have been developed for tailor-made application in a specific organization. It was possible to collect data not only on results but also on the effects in the workplace. In formal education it is extremely difficult to establish reliable relationships between curriculum-design procedures and the impact of programmes on daily life of the students. Furthermore, the nature of the programmes under investigation differed from those in general education in terms of objectives, subject and duration.

As far as the relationship between curriculum developer and teacher is concerned, many aspects of the relational approach could be helpful in solving problems regarding the shared notions about the objectives of a programme, the intentions of the designer, and the procedures for running the programme. Here, too, the limitations of mere logic contingencies in curriculum design, based on a rigid systematic approach, may be revealed. On the basis of

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effects in the two separate studies.

theoretical generalization, powerful aspects in the relational approach based on communication skills, project management skills, consulting skills and encouragement of change would also apply to curriculum development in formal school education.

<u>Suggestions for further research</u>

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 neither rigorously rational nor strive for purely logical connections in the formal curriculum. If curriculum design were also perceived as professional artistry, additional categories of design principles could 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.

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. As a consequence, design standards that strive only 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 intervention strategies mainly focusing on the interpersonal dynamics of educational decision-making: procedures 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 also elaborate on their management role within that social enterprise of the educational decision-making process.

Thus, at the conclusion of this study we state some new hypotheses that are worth considering:

- 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 (as part of the relational approach).
- 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.
• Curriculum development that focuses on external consistency may create a process of high impact organizational learning.

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