CHAPTER 1

DEVELOPMENTS IN THE EDUCATIONAL EFFECTIVENESS RESEARCH PROGRAMME

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Abstract

Educational effectiveness as a research programme moved from an input–output paradigm to an input–process–output paradigm and, in view of the fact that so-called contextual school effectiveness is gaining in importance, this might be more properly termed a context–input–process–output-based approach. The aim of this introductory chapter is to put the state of the art of educational effectiveness research into perspective by summarizing the most important developments in output measurement, the identification of relevant input-, process- and contextual conditions and the causal modeling of these categories. Specific consideration is given to the improvement of substantive multi-level models of educational effectiveness and to available theories that could help to reveal the explanatory mechanisms behind these models.

The Educational Effectiveness Construct

Educational effectiveness research has its roots in economically-oriented studies of education production functions and sociological input–output studies. The former type of studies focused on educational inputs that are relatively easily expressed in monetary terms, examining to what extent educational investments pay off. Hanushek (1979) and Monk (1992) present overviews of this type of educational productivity research. The latter, sociologically-oriented, studies compared the influence on outcomes of malleable educational conditions to sociologically-determined background characteristics of students. Here the basic issue was equity in education. The Coleman report (Coleman *et al.*, 1966) is the most famous of the sociologically-oriented studies because its findings shed doubt on whether “schooling made a difference” and was a catalyst for a new

line of educational effectiveness research known as school effectiveness and research. The early school effectiveness studies like those by Brookover, Beady, Flood, and Schweitzer (1979), Edmonds (1979) and Rutter, Maughan, Mortimore, and Ouston (1979) gave a major boost to the educational effectiveness research programme, the basic message that came from their studies being that some schools were more effective than others even when the background characteristics of the pupil populations are controlled for. Moreover, they also presented evidence that these "net" school effects could be attributed to some extent to a set of school process characteristics. Although these studies became the subject of methodological criticism (Purkey & Smith, 1983; Ralph & Fennessey, 1983; Reynolds, 1985) from then on process characteristics of schooling like educational leadership, school climate, organizational characteristics and curriculum variants gained a permanent place in educational effectiveness studies.

In addition to the three schools of educational research referred to in the above studies on teacher and instructional effectiveness, one other very important research area should be mentioned. The results have been summarized in research syntheses like those by Walberg (1984) and Fraser, Walberg, Welch, and Hattie (1987) and in reviews such as by Brophy and Good (1986) and Creemers (1991). Instructional conditions like time on task, content covered and the structuring of learning processes that were identified in this type of research, will be taken as the core of integrated multi-level school effectiveness models that are discussed further on.

In more recent major educational effectiveness studies, like those carried out by Mortimore, Sammons, Stoll, Lewis, and Ecob (1988), in the U.K., the Louisiana School Effectiveness Study (Stringfield & Teddlie, 1988) and the study by Brandsma and Knuver (1989) in the Netherlands, a blending of the previously mentioned research traditions can be discerned. Comprehensive educational effectiveness models as discussed by Scheerens and Creemers (1989) form the conceptual basis for these studies, while statistical techniques for multi-level modeling provide the opportunity to test these models (De Leeuw & Kreft, 1986).

After this brief historical overview (a more extensive review is given in Scheerens, 1992), it is time to turn to the development of educational effectiveness as an empirical scientific construct. The question to be addressed is what are the basic elements of the term educational effectiveness to be distilled from these various research applications.

First of all it should be noted that effectiveness refers to goal attainment. Therefore the attainment of educational goals is central to the concept of educational effectiveness. Educational goals should thus be seen as the basis for the choice of output criteria in empirical educational effectiveness research. Some intricacies of this feature will be discussed in the next section.

Secondly, effectiveness should be seen as a causal concept; we are not only interested in measuring educational effects but particularly in attributing effects to (various types of) antecedent conditions.

Thirdly, the attribution of educational effects to antecedent conditions can be made explicit by distinguishing between the conditions one needs to "control for", on the one hand, and the malleable conditions one is primarily interested in, on the other.

To achieve the first aim, measures should be adjusted for student background characteristics to arrive at what is known as value-added effectiveness criteria. The antecedent conditions that are really of interest are characteristics of school environ-

ments, schools as organizations and of classroom practice, as these can account for variance between schools, classrooms and individual students.

In the fourth place certain (empirically verifiable) assumptions about the robustness and scope of educational effectiveness are made. Here the central questions are whether school effectiveness is stable, whether effectiveness-enhancing conditions are general or dependent on contextual arrangements or specific characteristics of sub-groups of pupils and whether or not effectiveness pertains to all sub-units of the organization (Scheerens, 1993a).

Deliberations about the Effect Criterion

Since the definition of educational effectiveness refers to educational goal attainment, the choice of the criterion or “dependent variable” is as undetermined as educational goals are multiple. In actual practice, achievement tests in basic school subjects have been used as the predominant effect criterion in most empirical studies, resulting in criticism of a too “narrow” emphasis. The obvious remedy would be the inclusion of multiple outcomes for which the following categories might be considered:

- *Basic skills and knowledge*, as emphasized in the early effectiveness studies for the very good reason that, in their emphasis on improving the position of disadvantaged students, these were the fields where compensation was thought to be most needed (cf. Brookover *et al.*, 1979; Edmonds, 1979; Murphy, 1992). The acquisition of these skills and knowledge provides the basis for learning in other areas. In this domain the use of curriculum-dependent tests in preference to general academic tests has been a hotly debated issue (Madaus, Kellaghan, Rakow, & King, 1979; Bosker & Scheerens, 1989). The present authors would opt for an eclectic approach to this issue: choose a curriculum dependent test when there is a particular interest in formative curriculum evaluation and use more general tests in all other cases.
- *Examination results and school career data*. Standardization will of course be an important condition whenever examination results are considered as the effect criterion. When educational attainment is measured in terms of the number of students passing exams from a particular cohort, specific selection procedures used by schools should also be taken into account (Bosker & Scheerens, 1989).
- *Behavioral criteria, social skills, attitudes and moral development*. This rather heterogeneous category covers the non-cognitive domain of schooling. The idea behind the inclusion of this type of criterion in educational research is that schools should be more than just places for academic development and should also be concerned with good behavior and non-cognitive development. The relative emphasis on the non-cognitive domain depends on educational philosophies, tradition and the particular culture within an educational system, preferences which are also likely to be reflected in the criterion choice in effectiveness studies. It should be noted that some of the major effectiveness studies, such as those by Rutter *et al.* (1979) and Mortimore *et al.* (1988), included non-cognitive, particularly behavioral criteria, such as attendance and good or bad behavior at school.

An intriguing question is the relationship between academic and non-cognitive outcomes: to what extent are they interrelated and, if so, is there a clear causal direction? Mortimore *et al.* (1988) found no relationship between the academic and affective outcomes of education, but Marsh, Smith, and Barnes (1985) found a negative relationship. In a recent Dutch study by Knuver (1993) a positive association between attitudes towards arithmetic and academic results was found, after which it was shown through testing alternative LISREL-models, that academic achievement could be interpreted more as a cause of attitudes and other affective outcomes than the other way around (positive attitudes towards arithmetic "causing" academic success). The message from this study appears to be that at least some affective outcomes should be seen as the "by-products" of academic achievement and thus not be given undue emphasis as a specific category of outcomes in educational effectiveness research.

- *Higher order skills.* New philosophies on learning and instruction, like constructivism (Jonassen, 1992), emphasize problem solving, self regulated learning and learning to learn. Although the protagonists of these approaches differ on the question of whether assessment of educational outcomes is at all desirable, it is to be expected that they will stimulate the use of tests of general cognitive skills and in-depth investigation of samples of pupils' work as effect indicators.
- *Long-term educational outcomes and transfer to the working place.* These types of outcomes have, as yet, received little emphasis in educational effectiveness research. This is easily explained by the fact that effectiveness studies are usually conducted at the primary or lower-secondary level. Examples of long-term educational outcomes are achievement in the "next" (higher) school category or even in occupational positions, given a particular level of formal schooling. In vocational education and corporate training performance on the job is a likely candidate to the effectiveness criterion to be chosen in studies that pertain to these educational fields.
- *Equity.* Rather than raising overall achievement (excellence), that part of educational effectiveness research that became associated with the effective schools "movement" has been concerned with the achievement of disadvantaged learners. In fact, this orientation generates no additional effectiveness measures but rather points at different ways of using achievement data. One could, for example, examine the result of a particular disadvantaged sub-group and find out whether some schools do better than others in raising achievement levels for this particular sub-group. This is known as "differential effectiveness" (Nuttall, Goldstein, Prosser, & Rasbash, 1989; Jesson & Gray, 1991). A second possibility, which requires data at the individual student level, is to examine the regression of achievement on innate ability and compare the regression slopes between schools. In this way not only the overall achievement level of a school but also its "compensatory potential" can be determined. The results of studies that have looked at the compensatory potential of schools have not been encouraging and indicated that differences between schools in improving the position of disadvantaged students with reference to their own aptitudes tend to be almost negligible (Brandsma, 1993; Van der Werf, Weide, & Tesser, 1991). In the latter study schools that had relatively high achievement levels also did well in raising the levels of disadvantaged groups (children from immigrant workers) families.

This indicates that there does not need to be a trade-off between excellence and equity, although it is quite realistic to expect that effective education by raising achievement levels of all sub-groups of students, and even more of the advanced students, will increase the overall variance, in other words the gap between advantaged and disadvantaged learners.

Other issues concerning effectiveness criteria are the (in)stability of school effects, the relatively small magnitudes of these effects and the different methods for making adjustments for students' background characteristics but as an overview of these issues has already been given by Bosker and Scheerens (1989) they will not be discussed in detail here. Both the areas of the stability of school effectiveness and the use of proper adjustment techniques remain on the agenda of what has been termed "foundational studies in educational effectiveness" (Scheerens, 1993a). When considering the small school effects (in terms of the between-school variances in student achievement) and the, as a matter of course, even smaller magnitudes of the effects of the variables that are considered as the causes, it should be noted that the practical implications in terms of money and school careers are likely to be far-reaching. A methodological implication of the small-school effects is the need for criterion measures that are sufficiently sensitive to detect these between-school differences.

To some extent the choice of effectiveness criterion will follow the emphasis that is put on certain types of educational objectives for a particular school category. In primary and secondary education achievement tests in the basic school subjects are likely to remain the core criteria in educational effectiveness research, since teaching basic subjects can be seen as the core business of schooling. By comparing the relative success of schools on several criteria the use of multiple effectiveness criteria offers an additional opportunity to assess the robustness of educational effectiveness (Bosker, 1991; Luyten, Chapter 5).

Process or Throughput Factors that Contribute to Educational Effectiveness

In a systems approach a distinction is made between input, context and processes or throughput and output of education. The input consists of all kinds of variables connected with financial or personal resources and with the background of students. What is meant by "context" is the socio-economic and educational context of schools, for example the guidelines and regulations for schools and other characteristics of the formal structure of (national) education systems. The central question school effectiveness research deals with concerns the kind of factors within the school and classroom that make a difference between effective and less effective schools. In fact, this question was the background of the school effectiveness movement that started with the first studies in this field by Brookover *et al.* (1979) and Edmonds (1979). Their research indicated that schools differ in the extent to which they achieve results with comparable groups of students. Early school effectiveness research was aimed at finding the process or throughput factors that made the distinction between effective and less effective schools. In these so-called "outlier" studies evidence was found that a small number of factors contribute to effectiveness. Most famous in this case was Edmond's distinction of five factors: educational leadership, emphasis on the teaching of basic

skills, high expectations of pupils' progress, an orderly and safe climate and frequent evaluation (Edmonds, 1979). These early studies were mostly outlier studies, but, after criticism of the methodology, more survey studies were carried out, enlarging the list of characteristics of effective education. When the idea of effective education spread from the U.S.A. to other countries, replication studies were carried out to test whether or not the same characteristics of effective education could be found in other countries. The results of these studies did not quite confirm the validity of the list of factors produced by research in the U.S.A. Generally speaking, the list of characteristics was enlarged and the replication studies could not find much empirical evidence for certain factors or characteristics. Creemers and Lughart (1989), Creemers and Knuver (1989), Creemers (1992), Levine (1992), Levine and Lezotte (1990), Reynolds (1989, 1991, 1992), Scheerens (1990, 1992) and Stringfield and Schaffer (1991) sum up, each for their own country, factors that make a difference between effective and non-effective education within schools and classrooms. Especially interesting is the review of research provided by Levine and Lezotte in 1990. First they produce a list of factors as mentioned in Table 1.1, based on 400 studies on school effectiveness in the U.S.A.

Table 1.1

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- Productive school climate and culture
 - Focus on student acquisition of central learning skills
 - Appropriate monitoring of student progress
 - Practice-oriented staff development at the school site
 - Outstanding leadership
 - Salient parent involvement
 - Effective instructional arrangement and implementation
 - High operationalized expectations and requirements for students
 - Other possible correlates
-

From Levine & Lezotte, 1990, p. 10.

This general list, which contains almost everything that can be found in schools and can even be extended to cover "further possible correlates", is broken down into other factors, for example, the correlates for effective instructional arrangement and implementation as given in Table 1.2.

Table 1.2

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- Successful grouping and related organizational arrangements
 - Appropriate pacing and alignment
 - Active/enriched learning
 - Effective teaching practices
 - Emphasis on higher order learning in assessing instructional outcomes
 - Coordination in curriculum and instruction
 - Easy availability of abundant, appropriate instructional materials
 - Classroom adaptation
 - Stealing time for reading, language and math
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From Levine & Lezotte, 1990, p. 10.

This results in a list of hundreds of correlates of effectiveness, which may be suspected to reflect differences in research methods and techniques to a larger degree than substantive results that are meaningful within the framework of available models and theories.

In the correlational studies a large number of schools and variables are involved. In Mortimore, Sammons, Stoll, Lewis, and Ecob (1989), a study carried out in the U.K., twelve factors could be found (Table 1.3).

Table 1.3

—	Purposeful leadership
—	The involvement of the deputy-head
—	The involvement of teachers
—	Consistency among teachers
—	Structured lessons
—	Intellectually challenging teaching
—	Work-centred environment
—	Limited focus within sessions
—	Maximum communication between teachers and pupils
—	Record-keeping
—	Parental involvement
—	Positive climate

From Mortimore *et al.*, 1989.

All of them are comparable with the factors mentioned by Levine and Lezotte, but Mortimore found fewer factors than Levine and Lezotte. Quite a number of the factors discovered in the American studies did not prove to be very effective. In twelve Dutch studies even fewer factors could be found to distinguish effective from non-effective schools, of which some provided evidence for the five factors distinguished by Edmonds. Scheerens and Creemers conclude that an orderly climate, frequent evaluation, achievement orientation, high expectations and direct instruction seem to contribute to effectiveness in the Netherlands (Scheerens & Creemers, 1989). Other evidence on the cultural bias vs. the generalizability of lists of process factors that are expected to be associated with favorable educational outcomes is provided in international comparative analyses of achievement in particular subjects (Scheerens, Vermeulen, & Pelgrum, 1989; Postlethwaite & Ross, 1992).

This overview of the search for effectiveness-enhancing process or throughput factors demonstrates the limitations of a strongly empiricist approach, which sometimes appears like one big fishing expedition for positive correlations. As other reviewers (e.g., Mortimore, 1991) have also stated, what is required is a more conceptual approach where effectiveness research can become more theory-driven. In the ensuing sections conceptual modeling of educational effectiveness and the use of available theory will be referred to as a basis for further empirical research.

Modeling Educational Effectiveness

In recent years some models on school effectiveness have been developed. The basic structure of these models is described in Scheerens and Creemers (1989) —

Figure 1.1 Comprehensive framework for educational effectiveness.

see Figure 1.1. Apart from the distinction between educational input, throughput or process, output and context that was already introduced, educational phenomena are defined at several levels. These levels are the individual student, the classroom, the school and the school environment. The combination of processes studied at these levels reflects the integration of several research traditions that was discussed in a previous section: at the lower levels learning and instruction are the central processes, whereas at the intermediate and higher levels the focus is on instances of planning, organization and management. Various interpretations are possible as far as the way these levels are thought to interact (Scheerens, 1992; Bosker & Scheerens, Chapter 3), the most common interpretation being that factors at higher levels facilitate processes at lower levels. Examples of educational effectiveness models that follow the above structure are those by Scheerens (1990), Creemers (1991) and Stringfield and Slavin (1992). As an example Creemers' model (see Figure 1.1) will be described in somewhat more detail.

In this model a distinction is made between achievement, educational attainment and output. The (ultimate) output can be the professional or educational career of the students and the results in examinations, but the immediate output is the achievement levels in tests connected with educational objectives, the criterion for effectiveness. The students' background and their abilities, motivation and aptitude, strongly determine their achievements. Other input factors are the resources of the school, teacher

background, experience and expectations. With respect to throughput or process conditions, time and opportunity to learn are the central mediating factors. Time for learning refers to the time students can spend on school learning, the educational task, but time is also determined by processes at the school and instructional level. Time-on-task is the time students are really involved in learning, which can under certain conditions be expanded by homework. But this time has to be filled by opportunities to learn. These opportunities concern the supply of learning material and experiences, exercises by which students can acquire knowledge and skills. In fact learning opportunities can be seen as the instructional operationalization of the objectives of education, whereas achievement tests are the evaluative operationalization of the same objectives. In this respect one can operationalize the content coverage of the curriculum in terms of the correspondence between items taught and items tested.

At the instructional level the conditions for effectiveness can be defined for several components: the learning material, the procedures for grouping students, and teacher behavior.

Based on meta-analysis of a number of studies a list of characteristics that fall within these three components was made.

With respect to *learning material* they include the following:

- The extent to which curricula offer opportunities to learn: quantity of subject matter offered, and degree of overlap between goals (that should be tested) and subject matter;
- explicitness and ordering of goals;
- structuring and clarity of subject matter (in relation with goals);
- use of advance organizers;
- the extent to which curricula evaluate student achievement and provide extra support for corrective instruction.

With respect to *grouping procedures*:

- Mastery learning, heterogeneous grouping and co-operative learning can induce effectiveness;
- the effectiveness is dependent on:
 - × Availability of differentiated learning material
 - × testing, feedback and corrective instruction.

With respect to *teacher behavior*:

- Management of the classroom;
- orderly and quiet atmosphere;
- high expectations;
- clear goal setting:
 - × Restricted set of objectives
 - × emphasis on basic skills
 - × emphasis on cognitive learning and transfer;
- structuring the content:
 - × Ordering of objectives and content
 - × advance organisers
 - × making use of prior knowledge of students;

- clarity of presentation;
- questions (low order/higher order) wait time;
- immediate exercise after presentation of new content;
- evaluation/testing and feedback;
- corrective instruction.

Some of the above-mentioned characteristics will have to be defined more precisely. For example with respect to learning material and teacher behavior the term “structuring” is used, but structuring does not mean anything without a further determination of what is meant by it. Structuring has to include considering prior knowledge, the use of advance organizers, providing content according to the objectives in small steps, the clear presentation of central concepts, dividing the content into small units (including clarity in the presentation) and immediate exercises after presentation of the content. Structuring is not restricted to basic knowledge and skills but is also important in, for instance, scaffolding (Palincsar & Brown, 1989) in higher order learning.

It is obvious that teachers are the central component in instruction at the classroom level. They make use of learning material and actually carry out the grouping procedure in the classroom. But teachers need learning material and, in organizing grouping procedures, learning material that is consistent with the grouping procedure used is necessary.

At the school level one can make a distinction between the educational arrangements of the school, which include the development plan of the school, and the organization of the school. The educational policy of the school is codified, written down in the development plan and has to deal with the aims and objectives of the school. In this respect a restricted set of objectives is important: structuring of the objectives in different grades, the transition between the grades, the evaluation policy, monitoring of students within grades and between grades, and the policy for adaptive instruction within the school with respect to the subjects and grades. The concept of the “organization of the school” covers the way schools try to secure this within grades, between classes and between grades, and is based on the notion that school policy with respect to education is carried out by teachers and students. School climate has to do with a quiet and orderly atmosphere, the responsibility teachers take for students’ progress and the responsibilities students take for their own learning. This relates to the educational leadership of the principal but also to the cohesion in the team and the control of students and teachers. In this respect aspects of coordination are important, like: *consistency* in the classroom between textbook, teacher behavior and grouping procedures; *cohesion*: every team member underlines the principles and behaves that way; *constancy*: during their whole school career (between grades) students receive the same “treatment” and the *control* of students and teachers.

Above the school level some contextual conditions which have to do with national policy can enhance school effectiveness, like programmes for educational assessment and the development of indicator systems, national guidelines for development plans or curricula. On the one hand they can explain differences between countries, but on the other hand it is far more important to look at the variation to see how different schools deal with these national guidelines.

Comprehensive educational effectiveness models like the one described above still raise quite a few questions, some of which will be dealt with more extensively in the

ensuing chapters of this volume. For one thing, there should be more clarity about the precise nature of interrelationships between conditions at various levels. Another issue concerns the correspondence between substantive conceptualization and formal representation by means of the available techniques. Finally, there is still the quest for a more limited set of basic mechanisms that might **explain** educational effectiveness in addition to mirroring empirical regularities.

Towards a Theory on Educational Effectiveness

Following Snow's (1973) stages of theory development, models and theories can be thought of as positions on a continuum. Thus theories can be seen as "improved" models, where improvement means that central propositions gain in precision and generalizability and relationships become more formalized. In this way theory development on educational effectiveness can be taken as a gradual process of improvement of the available models, such as the ones described in the previous section.

Next to this rather inductive approach a deductive line of thinking could also be attempted. Such an approach comes down to applying models and theories from "mother disciplines" like economics, learning theory, social psychology and organization theory to interpret educational effectiveness phenomena and generate hypotheses for further empirical research.

Formalization of the basic relationships of conceptual multi-level school effectiveness models is the subject of the chapter by Bosker and Scheerens in this volume.

An example of the search for a limited set of basic concepts to be interpreted as the core of educational effectiveness models is to be found in Creemers' distinction of three basic factors that apply at various levels (Creemers, 1993a). The point of departure for Creemers' propositions is the well-known Carroll model and more recent elaborations of it. Three main effectiveness enhancing factors are distinguished: (i) time for learning; (ii) learning opportunities and (iii) quality of education. According to the "beginning teacher evaluation study" (Fischer, Berliner, Filby, Marliave, Cahen, & Dishaw, 1981) and other studies later on, academic learning time can be defined in terms of the time schedule, the amount of hours in the schedule devoted to subjects and ultimately the time students are engaged in learning. This means that at different levels of education time-on-task is an important issue and can be defined as a contributing factor to educational outcomes. Except for time itself, it is important what students learn, what they do in relation to the educational outcomes. Based on the results of IEA studies one can conclude that the amount of time devoted to a specific subject within the time schedule of the class and the school is a good predictor of educational outcomes.

Next to time and learning opportunities the quality of instruction and schooling is an important factor for educational effectiveness. Quality is referred to as those characteristics, factors and variables in instruction and school functioning as a whole that contribute to the explanation of differences in outcomes between students in different classes, schools and educational systems.

As shown in Figure 1.1, the quality of instruction and school policies influence the time available and opportunity for learning. Thus the time for learning and the opportunity to learn is increased if the quality of instruction is good.

The characteristics of the quality of education at the classroom level were summed up in the previous section.

As to the expression given to these three basic factors at school level, the model depicted in Figure 1.1 defines school-level factors as facilitating conditions for classroom-level factors. This definition restricts the selection of school-level factors to only those factors conditional for and directly related to quality of instruction or to time allowed/opportunity to learn.

According to Creemers (1991), school level factors should either promote cohesion between teachers (stimulate similar effective teacher behavior in all classrooms) or control what is going on in classrooms. At the school level a distinction can be made between educational and organizational aspects.

On the basis of these cohesion and control principles, the following indicators at school level can be described for quality of instruction with respect to the educational aspects:

- Rules and agreements about all aspects of classroom instruction;
- an evaluation system at school level to check pupil achievement, to prevent learning problems or to correct problems at an early stage (regular testing, remedial teaching, student counseling, homework assistance).

With respect to the organizational aspects of the school level important factors are:

- A school policy on intervision and supervision of teachers, section leaders and school principals (educational leadership);
- a school policy to correct and further professionalize teachers who do not live up to the school's standards.

Indicators of time at the school level are:

- The development and provision of a time schedule for subjects and topics;
- rules and agreements about time use, including the school policy on homework, pupil absenteeism, cancellation of lessons;
- the maintaining of order in the school.

Indicators of opportunity to learn at school level are:

- Development and availability of a curriculum, school working plan or activity plan;
- rules and governments about how to proceed, how to follow the curriculum, especially with respect to transition from one class to another or from one grade to another.

Creemers (1991) points at the importance of continuity in all indicators mentioned above, meaning that schools should not change rules and policies every other year. This constancy principle, however, can only be found in a longitudinal setting, by comparing school level factors from year to year.

The same components as mentioned before, quality, time and opportunity to learn, can be distinguished at the level of national educational systems. Quality regards the availability of an indicator system or national policy on evaluation. Time refers to the national guidelines with respect to the time schedule for schools and opportunity to

learn refers to the national guidelines and rules with respect to the topics/subjects to be treated in schools, such as a national curriculum. The already mentioned evaluation policy implies a control mechanism with respect to time and opportunity to learn.

The relevance to school effectiveness modeling of available theories and models from economic and social sciences cannot be discussed at great length here. Instead, a brief overview follows (more details are given in Scheerens, 1992).

Theories of learning and instruction, such as the Carroll model, are at the core of multi-level educational effectiveness models. This has been illustrated to some extent in the previous sections. An interesting area for further investigations concerns the implications for classroom practice on school organizational arrangements when the basic outlook towards learning and instruction is changing, as is the case with constructivism (Jonassen, 1992; Murphy, 1992; Scheerens, 1993b).

Models of coordination in educational organizations, like the garbage can model of organizational decision-making and the idea of loosely-coupled systems (Cohen, March, & Olson, 1972) underline the discretionary power at the lower level of educational organizations and thus illustrate the limitations of higher level control over the functioning of lower levels.

Contingency theory draws attention to environmental factors on which effective arrangements of organizational conditions at the school level may depend. Several of the basic premises of Creemers' model, like the consistency and cohesion requirements, as well as the "mirroring" of a limited set of instructional conditions at higher organizational levels can be seen as special cases of the configuration thesis, that is the principle that internal elements and aspects of organizational functioning should fit together, belonging to contingency theory (Mintzberg, 1979).

Cybernetics and the idea of the learning organization (Senge, 1990) provide some explanatory background to the often established importance of evaluation at all organizational levels.

Public choice theory underlines the importance of choice and market-based control mechanisms as possible effectiveness-enhancing conditions (Boyd & Crowson, 1985; Chubb & Moe, 1990). Axioms from this theory might be used to explain the general conclusion from many empirical studies that private schools tend to do better than (comparable) public schools.

Developments in the field of research on *education production functions* draws the attention of effectiveness researchers to new areas, in particular allocation procedures for matching teachers with specific capacities to groups of students with certain "difficulty-levels" (Monk, 1992).

Finally, some hypotheses have been formulated on the mechanisms through which schools gradually become more or less effective (Slater & Teddlie, 1992). This type of *school effectiveness dynamics* may stimulate longitudinal and historical research on the development of schools over longer periods of time.

Despite the potential of the pieces of available theory, a more deductive approach in which these lines of thinking are used to generate hypotheses for future educational effectiveness research is still practically non-existent (although the present authors are trying to use some of these ideas in recently initiated studies).

Conclusion and Preview of the Volume

A review of the state of affairs concerning the ongoing research programme on educational effectiveness indicates several areas that should remain high on the research agenda (Scheerens, 1993a):

- Research that aims at the improvement of educational effectiveness models, by means of further conceptual work, the application of formal methods for model-building and testing and a better use of available theories;
- foundational studies that are aimed at establishing the conceptual boundaries of the construct of educational effectiveness; issues of stability, generalizability across contexts (among which international comparisons have an important place) and sub-groups of students (differential effectiveness), consistency of effectiveness across effectiveness criteria and organizational sub-units (e.g., grades within a school);
- methodological and research-technical innovations, with respect to the application of multi-level and path-analytic techniques, but also in more down-to-earth areas as the development of valid and reliable instruments for data-collection, the proper conduct of field studies and quasi-experiments;
- last but not least, “normal” school effectiveness research is needed in which comprehensive and more partial models are empirically investigated in all kinds of educational settings.

The contents of this volume are to some extent focused on review and model-building, but there are also chapters that deal with methodological advances and chapters that provide examples of the empirical exploration of partial effectiveness models.

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