DOCUMENT RESUME

ED 361 828 EA 025 038

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TITLE Towards a Theory on Educational Effectiveness.
PUB DATE Jan 93
NOTE 31p.; Paper presented at the Annual Meeting of the International Congress for School Effectiveness and Improvement (Norrkoping, Sweden, January 1993).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Educational Improvement; *Educational Quality; Effective Schools Research; Elementary Secondary Education; Foreign Countries; *Outcomes of Education; *School Effectiveness; Student Characteristics; Teacher Characteristics
IDENTIFIERS *Netherlands

ABSTRACT

Research on school effectiveness has shown that schools differ in regard to outcomes of comparable groups of students. Some schools are found to be more effective than others and these more effective schools have identifiable characteristics that help them excel. Outcomes measured to determine educational effectiveness include basic skills and knowledge, compensation or equity, social skills and attitudes, higher order skills, and several newer educational objectives. Educational effectiveness provides and requires a holistic theory on education, dealing with input, process, context, and products of education. Other criteria are sometimes used, such as expenditures, to determine effectiveness. A useful theory about important factors in the input of education must include factors like the student's and teacher's backgrounds and personal and financial resources for education. It is also important to distinguish between the significant factors at the class and school levels that contribute to educational effectiveness. Research on educational effectiveness needs to develop better designs for survey studies, better process measures, and better use of statistical techniques. (Contains 45 references.) (JPT)

TOWARDS A THEORY ON EDUCATIONAL EFFECTIVENESS

Bert P.M. Creemers

Summary

The concept of school effectiveness especially with respect to outcomes and processes is discussed. Based on the results of research, a model for educational effectiveness is developed which takes into account the factors at the classroom and school level and the relationship between the levels. For further elaboration of the model a relationship with the learning processes of students should be constructed.

1. Introduction

Attention to educational effectiveness has its origins in research and practice with respect to school effectiveness. The early research projects carried out by Brookover, Beady, Flood and Schweitzer (1979) and Edmonds (1979) in the USA and by Rutter, Maughan, Mortimore and Ouston (1979) in the UK have shown that schools differ from each other with respect to the outcomes of comparable groups of students. Some schools prove to be more effective than other schools and more effective schools have some characteristics in common which ineffective schools do not have. In educational policy making and practice the idea of effective schools also draws a great deal of attention, which is understandable because it offers possibilities of improving schools to get better results. In educational theory and research these results stimulated the start of research projects looking for factors that could explain effectiveness in education. Later on, serious criticism arose with respect to the methodology, the statistical analysis and the conceptual frameworks of the school effectiveness research (Purkey and Smith, 1983; Ralph and Fennessey, 1983; Reynolds, 1985).

Nevertheless, educational effectiveness is an important idea within the educational sciences. When the effectiveness of education at different levels of the system is analysed together, it can in a way be seen as the core matter of educational sciences and research. Educational research in this case is directed to explain the differences in educational outcomes based on a theory about causes and effects in education. In this sense educational effectiveness can be seen as a holistic theory about education which takes into account the outcomes of education, the inputs, the processes and the contexts in which education takes place.

In this sense it is a welcome addition to educational research in general. Such a programme has to address questions with respect to outcomes, criteria for effectiveness, inputs, processes and contexts.

2. Outcomes of education

In the past, research on school effectiveness was criticised with respect to the criteria of effectiveness. Research took educational outcomes in the academic field as the only criterion and in addition the measurement of this criterion was quite poor involving, for example, the proportion of students going from primary to secondary education or marks in school exams. At this moment the best criterion for educational effectiveness is the value education adds to the initial attributes of students. Effectiveness is related to objectives in education which distinguishes educational effectiveness from the study of educational effects, which also takes into account unexpected outcomes of education like the results of the hidden curriculum on the one hand, and on the other hand is distinguished from the concept of educational efficiency which is concerned with the relationship between the effects of education and the inputs of education, most of the time in terms of finance. Added value conceptions stress the point that students have a background, an aptitude for learning, and a home environment and peer group, etc., which has already contributed to the knowledge skills students have at the moment education starts. With respect to educational effectiveness we have to take into account the student's background as well as the student's initial attributes with respect to the specific objectives under study. This requires measurement of abilities like intelligence and motivation as well as initial attributes with respect to the objectives under study, like performance in mathematics, reading, etc.

Education stresses the point that the educational system contributes to educational outcomes at the different levels: the classroom level, the school level, and the contextual level. In research on educational effectiveness we have to specify the level under study and the factors at the various levels and in which way some levels can contribute to the processes at other levels. As said before, educational effectiveness restricts the criteria for effectiveness to what can be achieved by schools and what schools are for. School effectiveness research was criticised because it just takes into account superficial criteria, for example basic skills and knowledge. Therefore, at the moment within educational effectiveness multiple outcomes are proposed as criteria for effectiveness. The following outcomes are some of these multiple outcomes:

- Basic skills and knowledge, like reading, mathematics, language. Especially with respect to the background of educational effectiveness it is quite reasonable that in educational effectiveness there is such a great deal of attention given to basic skills and knowledge, because in these fields disadvantaged students did not succeed. (Brookover et. al, 1979; Edmonds, 1979)
- A criterion frequently used in the past for educational effectiveness was compensation for initial behaviour (equity). The idea of equity is connected with a

belief in the school effectiveness movement that schools can compensate, more or less, for initial differences. Based on educational research so far with respect to effectiveness, one can conclude that the possibilities for schools to compensate for these differences are quite small (Brandsma, 1993; Van der Werf, Weide, and Tesser, 1991). These studies obtain almost the same result as the evaluation of so-called compensation programmes in the past, like Head-Start, Follow-Through and in the Netherlands the project Education and Social Environment, obtained (Slavenburg and Peters, 1989; Scheerens, 1987). Although equity is a longstanding aim in education, it turns out that schools do not contribute much to the reduction of differences.

- Social skills and attitudes, for example towards school and towards different school subjects. The idea behind this is that schools should be more than places for academic development and that schools should be directed to developing academic and cognitive skills but also social and aesthetic skills and, on top of that, to influencing attitudes that are important in their own respect, but which can also influence academic outcomes.
- Higher order skills, like problem solving, are, especially in higher grades, useful criteria for educational effectiveness.
- On top of that a broad range of 'new' educational objectives are formulated in different fields, like educational technology, creativity and moral behaviour. It became clear, next to the discussion about the aims of education, that schools differ in the way they can achieve different kinds of objectives (Mortimore, Sammons, Stoll, Lewis, and Ecob, 1988; Knuver, 1993).

Some research results argue against the adoption of multiple outcomes within school effectiveness research immediately.

1. One of the most striking findings of school effectiveness research in the earlier years was the fact that schools with a restricted set of outcomes which did not go for a broad range of educational objectives but restricted themselves to a small set of academic outcomes had better results than schools with a broad scope of educational outcomes. This holds especially for low SES schools (Teddlie and Stringfield, 1993). The recommendation for educational practice to steal time from other subjects for the basics can be seen as the practical implication of these empirical findings (Levine and Lezotte, 1990).
2. In the evaluation of the innovation within primary education in the Netherlands it turned out that schools that were the most innovative with respect to educational goals (different goals than in the past) did not achieve very well. These schools that addressed themselves to new areas of schooling had the worst results not only

in the new areas of education but also in the so-called 'old areas', like reading, mathematics and language. In this case it means: the more you want the less you get. (Van der Werf, 1988)

3. The suggestion that quality (or excellence) is something different than equity and that therefore these two are different objectives for education does not hold. An argument for this can be found in research carried out by Van der Werf and Weide (1991). In the evaluation of the Dutch educational priority programme, low effectiveness and high effectiveness schools were distinguished with respect to the results of Dutch as well as of immigrant students. These results are shown in Figure 1. It is clear from this figure that the variance in low effectiveness schools is quite high, that Dutch students in these schools perform below the general mean of Dutch students and that immigrant students in these schools perform far below the general mean of immigrant students. In high effectiveness schools immigrant students perform much better, although below the general mean of Dutch students, but they are close. Dutch students in these schools perform better than the general mean of Dutch students, although in this group the variance is smaller than in low effective schools. This means that 'going for quality' can also mean reducing the variance. This fact is contrary to results in most research, which shows that quality does not go along with reducing variance and even going for equity can increase variance, the so-called Matthew effect (Walberg, 1991). In the educational priority programme in the Netherlands a distinction is made between effective instruction and specific activities for immigrant students to reduce the gap between Dutch and immigrant students. In Table 1 activities related to effective instruction and to specific activities are summarised. Effective instruction characteristics are based on research in different areas, like direct instruction, research on grouping activities and research on student assessment. The specific activities are directed to improving language abilities and reducing the gap between the school and the home environment.

   Table 2 provides the results of the analysis between effective and ineffective schools with respect to the quality dimension, the equity dimension and the combination of quality and equity. Contrary to what one expects, there is no difference between effective instruction and specific activities with respect to the effects on quality and equity measures. In fact, most of the time activities related to effective instruction count for both high quality and equity. This means that quality and equity probably are not so different as suggested in the list of multiple outcomes. This is also contrary to the position of Nuttall et al. (1989), who suggest that effective schools are differentially effective for different groups. It

seems that what is good for the brighter students in effective education could also be appropriate for disadvantaged students.

4. In recent publications Knuver (1993) and Knuver and Brandsma (1993) also present the results of research on the relationship between so-called affective outcomes and academic outcomes in education. The background of the study was that in other studies it turned out that there is no relationship between academic and affective outcomes of education (Mortimore et al., 1988) or even a negative relationship (Marsh, Smith, and Barnes, 1985). In the Dutch study it turns out that the academic outcomes have in fact an effect on the attitude towards arithmetic, towards schools and the well-being of students. This attitude has an effect on attitude in the next year as well as on the academic results of the following year. This indicates that attitudes, and other affective outcomes, are the result of academic outcomes.

   Based on the results of this study one should consider affective outcomes as the results of academic outcomes and one should not put too much emphasis on affective (and maybe also other outcomes) as separate independent results of education.

The foregoing dealt with the criticisms with respect to outcomes, especially the criticism that the effect criterion in educational effectiveness research is not well chosen. There are more possibilities for criterion definition and from a technical point of view it is no problem to develop instruments, but based on research results we have to be careful about that. But this is just one aspect of criticism. Another point of criticism is that the effects of effective schools are insignificantly small. In fact, this is a more general problem about the influence of education as a whole. This has to do with the question as to what education contributes to the educational career of students. We know that the largest part of the variance in school results between students is explained by aptitude and SES, just a small proportion of variance can be explained by variables at the school and instructional level (see for instance Walberg, 1984). The proportion of variance that is left over after aptitude and SES is $\pm$ 20%, depending on the study (and the statistical procedures). From these 20% just a small proportion is explained by factors we have studied so far in school effectiveness research (less than 1 till, at most, 2-3%). But when differences between effective and non-effective schools are phrased in terms of their effects on the individual school careers of students, it turns out that these differences (even if they are quite small in the Netherlands) mean that there is a difference between referring or not referring to special education, or the retention in one grade or not and the choice of a higher level of secondary education. So, even when they are quite small in a statistical sense, they can be

very important for the individual careers of students in a policy sense (Bosker and Scheerens, 1989).

There is a great deal of criticism with respect to the criteria of the objectives of education: it is also argued that the effects of schools are quite unstable. There are different figures for this in the different studies and the discrepancy between the results of the studies is quite large. Most of the time the correlation between school subjects within a grade is not that high in primary schools, which correlation is between .55 and .80 and in secondary schools between .45 and .75. This is also true between grades, in some studies this discrepancy is quite large between grade levels. In primary education correlations are found between .10 and .65 and in secondary education between .25 and .90 (Bosker,1991).

In summary: educational effectiveness provides and requires a holistic theory on education, dealing with input, process, context and products of education. The first question has to do with results, outcomes of education. This includes the criteria for educational effectiveness. From a technical point of view problems on the criterion side can be solved, but theoretically, on the conceptual side, there are some problems connected with the criteria themselves.

In the past most of the educational effectiveness research used academic outcomes as the only criterion. This choice of criterion was criticised and at the time being pleas were made for multiple criteria for effectiveness. Even when we follow that line of thinking we will have to keep in mind that there are always arguments against use of these multiple outcomes. Also when the effects of effective schools on education are quite small, they can be very crucial with respect to the individual careers of students. A remaining problem is the instability of effectiveness, but this probably has not only to do with the choice of criterion but more with the instability of education as a whole, between subjects, between classes and between grades.

3. Educational process: factors contributing to educational effectiveness

In the foregoing section we dealt with the problem of criteria for effectiveness and most objectives of education can be treated that way. Sometimes other criteria are used also, like the amount of money involved to achieve objectives which in fact is an efficiency criterion and can be used additionally to effectiveness. But most of the time schools and classrooms are evaluated based on the extent to which they achieve educational objectives. But, in fact, a theory on educational effectiveness is not concerned in the first place with the criteria or the criteria alone, but more with the question of how these objectives can be achieved. Educational effectiveness deals with the question why schools with comparable pupils initially differ in the extent to which they achieve the objectives. What

are the processes, the factors that contribute to educational outcomes in effective schools? 'Comparable' is a difficult concept. It can mean the same kind of children, the same intellectual and socio-economic background, but even in this case schools can differ in financial resources, the level of competence of teachers and the social context of the school. In a system approach a distinction is made between input, context and processes (next to product) of education. The input consists of all kinds of variables connected with financial or personal resources and with the background of students. By 'context' is meant the socio-economic and educational context of schools, for example the guidelines for education and the (national) evaluation systems. The most important factors concern the process which is going on at the classroom and school level. The question school effectiveness research deals with most of the time is what kind of factors within the school and classroom 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 proved that schools differ in the extent to which they can achieve results with comparable groups of students. Early school effectiveness research was directed to finding the 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 the so-called five-factor model of Edmonds (1979). Later on this model was criticised from a methodological and conceptual point of view (Scheerens and Creemers, 1989). But in the early days of school effectiveness and school improvement the five-factor model and later on other models with some more factors in them, drew a great deal of attention from educational practice and policy making. It seemed quite easy to change schools from non-effective to effective by just introducing programmes in which some factors could be improved, like for example the evaluation of student progress in schools or (in-service) training for the improvement of the educational leadership of principals (Lezotte, 1989).

Later on it turned out that it is not that easy to improve schools. Effective and non-effective schools differ in more than just a small amount of factors. This led to more research to distinguish between effective and non-effective schools. The earlier studies were mostly outlier studies, but, after criticism of the methodology of outlier studies, more survey studies were carried out, enlarging the list of characteristics of effective education. When the idea of effective education spread to other countries than the USA, 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 confirm the list of factors produced by research in the USA. Generally speaking, one can conclude that on the one hand the list of characteristics was enlarged and that on the other

hand the replication studies could not find much empirical evidence for these 'factors' or characteristics. In addition to this, a more conceptual approach was also advocated. Such a framework of theory could explain the differences between effective and non-effective education and this might be a point of departure for further research.

In (replication) studies of the last years, the results of these three movements (outlier studies, survey studies and theoretical studies) are presented. Creemers and Lugthart (1989), Creemers and Knuver (1989), Creemers (1992a), 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 3, based on 400 studies on school effectiveness in the USA. This general list, which contains almost everything that can be found in schools and can be enlarged with 'further possible correlates', is broken down into other factors, for example, the correlates for effective instructional arrangement and implementation are given in Table 4. In total this results in a list of hundreds of correlates of effectiveness, more a result of research methods and techniques than the generation of genuine, clear and relevant concepts in a theory about effectiveness.

In the correlational studies a large amount of schools and variables are involved. In this way, even small correlations can be significant. In the outlier studies mostly a few schools or classes but many factors are studied. Always some, or even a large number of, variables seem to distinguish between this small set of schools. Probably that is the reason why in replication studies quite a number of factors did not appear again. In Mortimore et al. (1989), a study in the UK, twelve factors could be found (Table 5). All of them are comparable with the factors mentioned by Levine and Lezotte, but Mortimore found less factors than Levine and Lezotte. Quite a number of the American factors did not prove to be very effective. In twelve Dutch studies even less factors could be found to distinguish between effective and 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 and Creemers, 1989).

Because of the criticism in the past, in recent years research has been improved, but research on educational effectiveness still has to deal with weaknesses with respect to:

1. the conceptual framework;
2. the limitation of effectiveness to a restricted set of components of education, the criterion problem and the outcome measures;
3. the design of the research studies and instruments used for measurement of processes;
4. the statistical procedures used so far.

We dealt with the criterion problem in section 2, in the following we will concentrate on the development of the conceptual framework for educational effectiveness. Related to this we will touch on the methods and statistical procedures. An important contribution to educational effectiveness research is made by the development of a conceptual framework, because it can guide the search processes, the design of studies and later on the interpretation of the results. Based on studies carried out so far it is possible to make a list of promising factors of educational effectiveness that have to be taken into account by developing a theory. It became evident that 'time-on-task' and 'opportunity to learn' are important intermediate variables that can explain student outcomes. Instructional and school processes that could be important are the instructional arrangements, high expectations, orderly climate, educational leadership, a restricted set of objectives and a clear mission for the school, evaluation and monitoring and a positive school-home relationship (like involvement of parents and support from parents in homework).

In recent years some models for school effectiveness have been developed. The basic idea behind all models for school effectiveness is to distinguish between more levels in education. At least all the models contain the individual student, learning, the classroom and the school level, and the higher levels in the model provide the conditions for what happens at the levels below (see Figure 2). At each of these levels, factors contribute to the outcomes or form conditions for what happens at the lower levels. This means that not just one factor induces results but a combination of factors.

Further developments of this basic model are provided by Stringfield and Slavin (1992), Scheerens (1991) and Creemers (1991). All these models have in common that they are more or less based on Carroll's model for school learning in which the time needed for mastering the educational objectives is a function of student characteristics - like ability and motivation - and the quality of teaching. Most of the models developed so far are quite precise at the instructional level. They make a distinction at that level between different components of instruction like the learning material, instructional behaviour and management behaviour of teachers and grouping procedures. The components like teacher behaviour can have characteristics that make a difference between effective and non-effective instruction. At the classroom level the characteristics of effective instruction of the components are related to time-on-task and opportunity to learn. The quality of

material, grouping and behaviour is in one way or another related to the time available for learning (and teaching) and what happens within this time framework, to what content is offered related to the objectives (opportunity to learn). Except for grouping, the other components - material and behaviour - are also related to the adaptation of instruction to the level of students, through ensuring appropriateness, structuring of the arrangements including evaluation and monitoring, reinforcement and incentives. At the school level a distinction between factors and variables is less clear. Based on ideas about how the school level can provide conditions for the instructional level and some insights from organisational theories, possible factors are discerned at the school level. In the QAIT-MACRO model (Stringfield and Slavin, 1992) these are meaningful goals, attention to academic functions, coordination, recruitment and training, and organisation. In the model provided by Scheerens (1990) the achievement orientation, the organisation of the school in terms of educational leadership and consensus, the quality of the school curricula in terms of content coverage, form and structure, and the orderly atmosphere are distinguished, showing again a combination of some curricular factors, objectives, content coverage, achievement orientation and some factors connected with the organisation of schools, like educational leadership. But how these factors can influence what goes on at the classroom level, between classes at the same grade level and between grade levels remains unclear. The same criticisms hold for the instructional model provided by Creemers (1991) in which again school curriculum variables and organisational variables are distinguished. Connected with this idea of some formal relationship between what goes on in classrooms, between classrooms and between the class and school level the ideas of consistency, cohesion, constancy and control are introduced.

In the first (outlier) study within the International School Effectiveness Research Program (ISERP) the same bundles of variables will be investigated both at class and school level. In this way the relative strength of the variables at these two levels will be apparent, but also the class/school interface will be opened by studying the within-school, between-class variances in processes and outcomes in order to get information about consistency, cohesion, constancy and control.

So far the models are not fully-fledged theories but just, as they call themselves, conceptual frameworks. They have to be developed based on further theory development and empirical research. The overall framework for further development can be sketched as in Figure 3.

Some further explanation of the model

In this model a distinction is made between achievement, educational attainment and output. The (ultimate) output can be the professional or educational career and the results

on examinations, but the immediate output is the achievement on tests connected with educational objectives, the criterion for effectiveness. The students' background and their abilities, motivation, perseverance and aptitude, strongly determine their achievements. As stated before, other input factors are the resources of the school, teacher background, experience and expectations. Time-on-task is in fact the time students are willing to spend on school learning, the educational task, but is also determined by processes at the school and instructional level. Time-on-task is the time students are really involved in learning and can 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 are the instructional operationalisation of the objectives of education, whereas tests are the evaluative operationalisation of the same objectives. In this respect one can speak about the content coverage of the curriculum.

Based on meta-analysis of a number of studies it is possible to make a list of characteristics of the three components of classroom instruction, learning material, grouping procedures and teacher behaviour which influence effectiveness.

With respect to learning material these are 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 organisers;
- the extent to which curricula evaluate student achievement.

With respect to grouping procedures:

- mastery learning, heterogeneous grouping and cooperative learning can induce higher effectiveness;
- the effectiveness is dependent on:
  - x availability of differentiated learning material
  - x testing, feedback and corrective measures.

With respect to teacher behaviour:

- management of the classroom;
- orderly and quiet atmosphere;
- high expectations;
- clear goal setting:
  - x restricted set of objectives
  - x emphasis on basic skills

- x emphasis on cognitive learning and transfer;
- structuring the content:
  - x sequence of objectives and content
  - x advance organisers
  - x making use of prior knowledge of students
  - x immediate exercise after presentation of new content;
- questions (low order/higher order) wait time;
- evaluation/testing and feedback;
- corrective measures;
- pacing.

Some of the above-mentioned characteristics have to be defined more precisely. For example with respect to learning material and teacher behaviour 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 giving attention to prior knowledge, the use of advance organisers, 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, 1989) in higher order learning.

It is obvious that the teacher is the central component in instruction at the classroom level. He makes use of learning material and he actually carries out the grouping procedure in the classroom. But, on the other hand, the teacher needs learning material and in organising 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 includes the development plan of the school, and the organisation of the school, the structure and the processes going on there which can influence what happens at the classroom level and between classrooms. 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 'organisation 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 the formal characteristics earlier mentioned are important, like: consistency in the classroom between textbook, teacher behaviour 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 in how different schools deal with these national guidelines.

4. Development of a theory on educational effectiveness

In the foregoing sections we described for the whole educational system the relationship between the different levels and components, especially with respect to educational effectiveness. It turns out that outcomes of education have to be determined very precisely, not just because we need a criterion for effectiveness but also to guarantee that in educational effectiveness we take into account the important components of education. Based on that we can develop a theory about important factors in the input of education including factors like the student's and teacher's backgrounds and the personal and financial resources for education. What is more important is to make a distinction between the important factors at the class and school level with respect to education that contribute to educational effectiveness or, to put it differently, that can explain differences in outcomes between students in different classes and schools.

It is clear that research programmes have to be carried out with respect to educational effectiveness. These research programmes are addressed to questions about effectiveness within and between countries to gain more insight into the contextual differences of educational effectiveness. For that reason we have to make better research designs for survey studies (or even experimental studies) to develop appropriate instruments, like more outcome measures, better process measures at different levels of education and we have to use statistical techniques like multilevel techniques and LISREL analysis or even a combination of both. In addition to survey studies we need in-depth analyses and especially studies on schools in transition from effective to non-effective status or from a non-effective to an effective stage.

Especially important at this moment is the further development of a conceptual framework even when this means a restriction of our focus to some components of the process of education in schools and classrooms. Most of the factors described are just a bunch of variables. The relationship between the above-mentioned models and the basic model (by Carroll) they are all related to is quite unclear. For that sake a relationship should be established between components at the instructional and school level and the components of Carroll's model. A vehicle for that development can be the main factors of effectiveness: 1) time for learning, 2) learning opportunities and 3) quality of education (at class, school and contextual level) (Creemers and Reynolds, 1993).

Carroll's model about learning in schools can be criticised for the fact that it does not explain how learning itself takes place, but it provides an overview of important factors that contribute to learning outcomes. Next to student factors like motivation, attitude and perseverance, factors at the classroom level are included, like time/opportunity to learn and quality. In Carroll's model the factors at the school level are not included. Carroll's model itself is often used as a point of departure for development of theoretical frameworks for school effectiveness and educational effectiveness.

The empirical support for factors at the school level was quite weak and there was a lack of theoretical linking between classroom and school factors. In the development of a middle range theory an attempt is made to develop a model for educational effectiveness that links all levels by defining the higher levels as conditional for the lower levels. Carroll's model is taken as a starting point. This means that, especially within the classroom and at the school level the concepts time, opportunity and quality are defined more precisely.

4.1 Classroom level

The original Carroll model does not pay much attention to the definition of factors at classroom level. Bloom (1976) elaborated some notions on quality of instruction in his theory on mastery learning, and the concept of content covered can be seen as a useful elaboration of the time allowed-factor. Slavin (1987) tried to build a model of effective instruction on the alterable elements of the Carroll model but the factors he mentions (quality of instruction, appropriateness of instruction, incentives and time use) do not reflect specific teacher behaviours any more than the original Carroll factors. Carroll (1989) emphasises the importance of going beyond the mere procedural aspects of instruction (such as frequency of testing) and looking for effective ways to present and organise contents of instruction. Information on these aspects can be found in teacher effectiveness process-product studies.

With respect to the process and input of education it became evident that academic learning time and time-on-task are closely related to the outcomes of education. According to the 'beginning teacher evaluation study' (Fischer et al., 1981) and other studies later on, academic learning time can be defined in different ways as 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 the 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 for educational outcomes. The test taken at the end of the educational process can be seen as an evaluative operationalisation or definition of the objectives. Education and instruction as provided in classrooms and schools can be seen as a more educational or instructional operationalisation of the same objectives.

Next to time and learning opportunities the quality of instruction and schooling is an important factor for educational effectiveness. By quality is meant those characteristics, factors, variables in instruction and the school as a whole that contribute to the explanation of differences in outcomes between students in different classes, schools and educational systems. According to Figure 3 the quality of instruction and the school influence the time and opportunity to learn. They enlarge the time for learning and 'facilitate' the use of the opportunity to learn for the students. The characteristics of the quality of education at the classroom level are summed up in section 3.

4.2 School level

Looking at the well-known lists of effective school factors (Scheerens, 1992), it becomes clear that most of the factors (such as an orderly climate in the school, evaluating student achievement at school level) are in fact reflections of the indicators of quality of instruction and time allowed/opportunity to learn at classroom level. Because of a lack of research studies that analysed school and classroom level in one design, it is hard to say what the separate contribution of these factors might be in accounting for pupil level variance when controlling for classroom level factors, In any case, many school level factors are somewhat meaningless when they are not clearly linked to classroom factors (Creemers, 1992b). Even if they do have an independent effect on pupil achievement, it is still not clear how this effect comes about and how it should be interpreted.

In the model the school level factors are defined as 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 behaviour in all classrooms) or control what is going on in classrooms. At the school level a distinction can be made between educational and organisational 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 counselling, homework assistance).

With respect to the organisational 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 professionalise teachers who do not live up to the school 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 the school level are:

- development and availability of a curriculum, school working plan or activity plan;
- rules and agreements 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, and for this reason is not included in the model.

4.3 Context, macro level

The same components as mentioned before, quality, time and opportunity to learn can be distinguished on a national level. 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 system has a control mechanism in it for time and opportunity to learn. It is clear that at the different levels also resources are important, but resources can be defined in the way it is done in this model: availability of material, teachers and other components supporting education in schools and classrooms.

References

Bloom, B.S. (1976). *Human Characteristics and School Learning*. New York: McGraw-Hill.

Bosker, R.J. (1991). De consistentie van schooleffecten in het basisonderwijs (Consistency of school effects in primary education). *Tijdschrift voor Onderwijsresearch, 16*, 4, 206-218.

Bosker, R.J. and Scheerens, J. (1989). Criterion definition, effect size and stability, three fundamental questions in school effectiveness research. In B.P.M. Creemers and D. Reynolds (eds.). *School Effectiveness and School Improvement*. Proceedings of the Second International Congress, Rotterdam. Lisse: Swets & Zeitlinger.

Brandsma, H.P. (1993). *Basisschoolkenmerken en de Kwaliteit van het Onderwijs* (Characteristics of primary schools and the quality of education). Groningen: RION.

Brookover, W.B., Beady, C., Flood, P., and Schweitzer, J. (1979). *School Systems and Student Achievement: Schools Make a Difference*. New York: Praeger.

Creemers, B.P.M. (1991). *Effectieve Instructie: Een Empirische Bijdrage aan de Verbetering van het Onderwijs in de Klas*. (Effective instruction: an empirical contribution to improvement of education in the class). 's-Gravenhage: SVO.

Creemers, B.P.M. (1992a). School effectiveness, effective instruction and school improvement in the Netherlands. In D. Reynolds and P. Cuttance (eds.). *School Effectiveness, Research, Policy and Practice*. London: Cassell.

Creemers, B.P.M. (1992b). School effectiveness and effective instruction: the need for a further relationship. In J. Bashi and Z. Sass (eds.). *School Effectiveness and Improvement*. Proceedings of the Third International Congress for School Effectiveness. Jerusalem: Hebrew University.

Creemers, B.P.M. and Knuver, A.W.M. (1989). The Netherlands. In B.P.M. Creemers, T. Peters and D. Reynolds (eds.). *School Effectiveness and School Improvement*. Proceedings of the Second International Congress, Rotterdam. Lisse: Swets & Zeitlinger.

Creemers, B.P.M. and Lugthart, E. (1989). School effectiveness and improvement in the Netherlands. In D. Reynolds, B.P.M. Creemers and T. Peters (eds.), *School Effectiveness and Improvement*. Proceedings of the First International Congress, London, 1988. Groningen: RION.

Creemers, B.P.M. and Reynolds, D. (1993, in press). *Development of a Middle Range Theory for Educational Effectiveness.*

Edmonds, R.R. (1979). Effective schools for the urban poor. *Educational Leadership*, *37*, 1, 15-27.

Fischer, C.W., Berliner, D.C., Filby, N.N., Marliave, R., Cahen, L.S. and Dishaw, M.M. (1981). Teaching behaviors, academic learning time, and student achievement: an overview. *The Journal of Classroom Interaction*, *17*, 1.

Knuver, A.W.M. (1993). *De Relatie tussen Klas- en Schoolkenmerken en het Affectief Functioneren van Leerlingen* (The relationship between class and school characteristics and the affective functioning of pupils). Groningen: RION.

Knuver, A.W.M., and Brandsma, H.P. (1993, in press). Cognitive and affective outcomes in school effectiveness research. Article for *School Effectiveness and School Improvement.*

Levine, D.U. (1992). An interpretive review of US research and practice dealing with unusually effective schools. In D. Reynolds and P. Cuttance (eds.). *School Effectiveness, Research, Policy and Practice*. London: Cassell.

Levine, D.U. and Lezotte, L.W. (1990). *Unusually Effective Schools*. A review and analysis of research and practice. Madison (USA): National Center for Effective Schools Research and Development.

Lezotte, L.W. (1989) School improvement based on the effective schools research. *International Journal of Educational Research*, *13*, 7, 815-823.

Marsh, H.W., Smith, I.D. & Barnes, J. (1985). Multi-dimensional self-concepts: relations with sex and academic achievement. *Journal of Educational Psychology*, *77*, 5, 581-596.

Mortimore, P., Sammons, P., Stoll, L., Lewis, D., and Ecob, R. (1988). *School Matters: The Junior Years*. Wells: Open Books.

Mortimore, P., Sammons, P., Stoll, L., Lewis, D., and Ecob, R. (1989) A Study of Effective Junior Schools. *International Journal of Educational Research, 13*, 7, 753-768.

Nuttall, D.L., Goldstein, H., Prosser, R. and Rasbash, J. (1989). Differential school effectiveness. *International Journal of Educational Research, 13*, 7, 769-776.

Palincsar, A.S., and Brown, A.L. (1989). Instruction for self-regulated reading. In L.B. Resnick and L.E. Klopfer (eds.). *Toward the Thinking Curriculum: Current Cognitive Research*. Alexandria: Association for Supervision and Curriculum Development.

Purkey, S.C. and Smith, M.S. (1983). Effective schools: a review. *Elementary School Journal, 83*, 4, 427-452.

Ralph, J.H. and Fennessey, J. (1983). Science or reform: some questions about the effective schools model. *Phi Delta Kappan, 64*, 10, 689-694.

Reynolds, D. (ed.) (1985). *Studying School Effectiveness*. London: Falmer.

Reynolds, D. (1989). School effectiveness and school improvement: a review of the British literature. In D. Reynolds, B.P.M. Creemers and T. Peters (eds.), *School Effectiveness and Improvement*. Proceedings of the First International Congress, London, 1988. Groningen: RION.

Reynolds, D. (1991). School effectiveness and school improvement in Great Britain. In B.P.M. Creemers, D. Reynolds, G. Schaffer [et al.]. *International school effects research workshop*. College of Education, National Kaohsiung Normal University, Kaohsiung, 209-227.

Reynolds, D. (1992). School effectiveness and school improvement: an updated review of the British literature. In D. Reynolds and P. Cuttance (eds.). *School Effectiveness, Research, Policy and Practice*. London: Cassell.

Rutter, M., Maughan, B., Mortimore, P. and Ouston, J. (1979). *Fifteen Thousand Hours*. London: Open Books.

Scheerens, J. (1987). *Enhancing Educational Opportunities for Disadvantaged Learners.* Amsterdam: North-Holland Publishing Company.

Scheerens, J. (1990). School effectiveness research and the development of process indicators of school functioning. *School Effectiveness and School Improvement, 1,* 1, 61-80.

Scheerens, J. (1991). Foundational and fundamental studies in school effectiveness: a research agenda. Unpublished paper commissioned by the Institute for Educational Research (SVO) in the Netherlands.

Scheerens, J. (1992). *Effective Schooling: Research, Theory and Practice.* London: Cassell.

Scheerens, J. and Creemers, B.P.M. (1989). Conceptualizing school effectiveness. *International Journal of Educational Research, 13,* 7, 691-707.

Slavin, R.E. (1987). A theory of school and classroom organization. *Educational Psychologist, 22,* 2, 89-108.

Slavenburg, J.H. and Peters, T. (eds.) (1989). *Het Project Onderwijs en Sociaal Milieu: Een Eindbalans.* (The Education and Social Environment Project: A final evaluation). Rotterdam: Rotterdamse School Advies Dienst.

Stringfield, S.C. and Schaffer, G. (1991). Results of school effectiveness studies in the United States of America. In B.P.M. Creemers, D. Reynolds, G. Schaffer [et al.]. *International school effects research workshop.* College of Education, National Kaohsiung Normal University, Kaohsiung, 139-156.

Stringfield, S.C. and Slavin, R.E. (1992). A hierarchical longitudinal model for elementary school effects. In B.P.M. Creemers and G.J. Reezigt (eds.). *Evaluation of Educational Effectiveness.* Groningen: ICO.

Teddlie, C. and Stringfield, S. (1993). *Schools Make a Difference: Lessons Learned from a 10-year Study of School Effects.* New York: Teachers College Press.

Walberg, H.J. (1984). Improving the productivity of America's schools. *Educational Leadership*, *41*, 19-30.

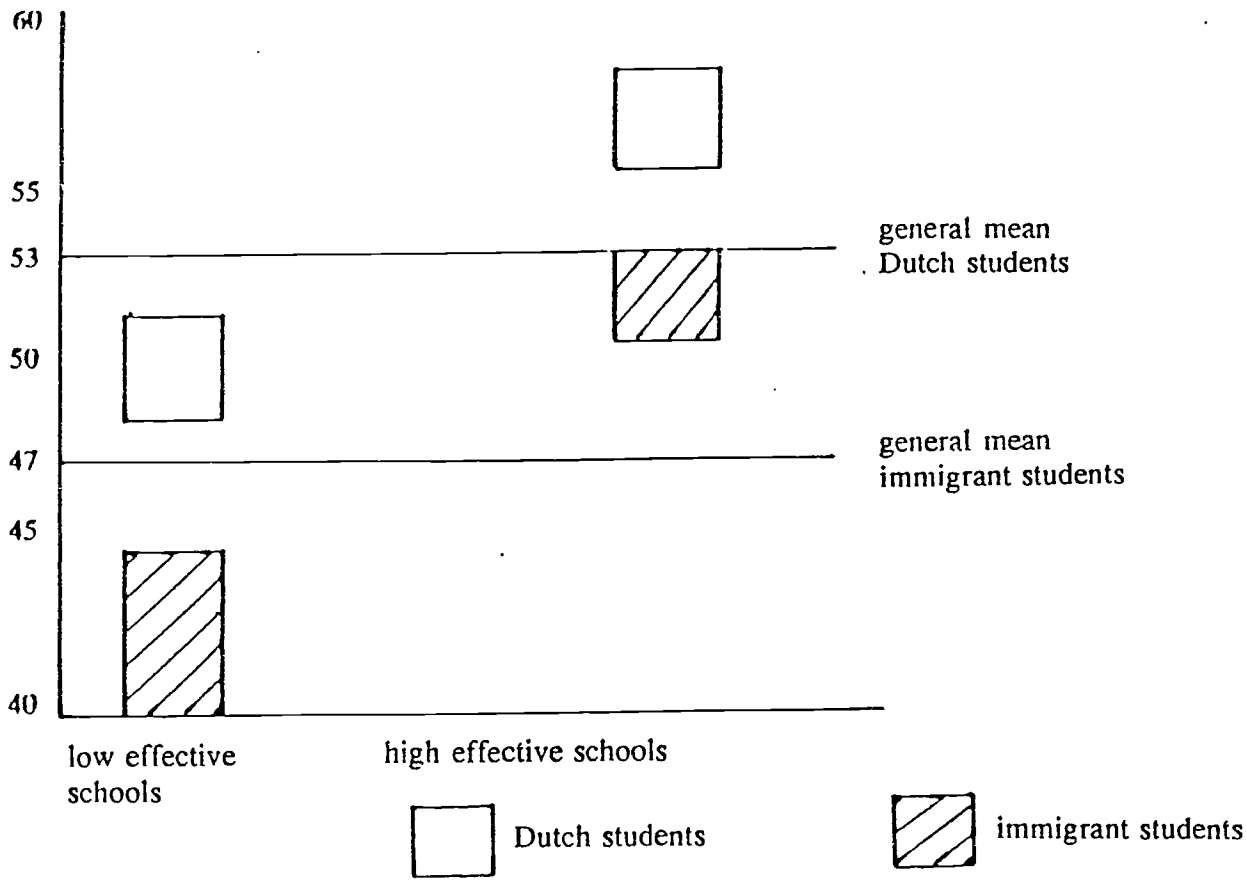
Walberg, H.J. (1991). Improving school science. *Review of Educational Research*, *61*, 1, 25-69.

Werf, M.P.C. van der (1988). *Het Schoolwerkplan in het Basisonderwijs: Ontwikkeling, Implementatie en Opbrengst* (The school work plan in primary education: development, implementation and outcomes). Lisse: Swets & Zeitlinger.

Werf, M.P.C. van der, and Weide, M.G. (1991). Effectief onderwijs voor allochtone leerlingen (Effective instruction for immigrant students). *Tijdschrift voor Onderwijsresearch*, *16*, 4, 231-243.

Werf, M.P.C. van der, Weide, M.G., and Tesser, P. (1991). *Het Onderwijsvoorrangsbeleid in de School en in de Klas. De Eerste Meting in het Basisonderwijs* (Educational priority policy in the school and in the class: a first measurement in primary education). Groningen/Nijmegen: RION/ITS.

Fig. 1



(Van der Werf and Weide, 1991, p. 239)

Table 1

Instructional characteristics

Effective instruction	Specific activities
Differentiation (grouping) (adaptive instruction)	Correction of language
Whole group instruction	
Minimal competency levels	
Orderly climate	Separate language lessons (language)
Rehearsing	Specific textbooks (language)
Repetition	
Evaluation	Extra learning (language)
Registration of progress	Special material (language)
Academic learning time	Promotion of reading activities
Homework	Activities for immigrant parents
Importance of cognitive objectives	
Orientation on content	

(Van der Werf & Weide, 1991, p. 235)

Table 2

Differences between teachers

	mean		scale
	high quality	low quality	
Whole group education	5.5	4.1	2-10
Orderly climate	39.6	36.1	9-45
Correction of language	2.6	9.9	3-15
Separate language lessons	12.6	2.8	1-5
Activities for immigrant parents	8.1	9.9	4-12
	high equity	low equity	
Whole group education	5.4	4.1	2-10
Orderly climate	40.3	37.9	9-45
Specific methods	2.9	1.5	1-5
Orientation on content	24.9	21.5	7-35
	high q/c	low q/c	
Orientation on content	26.6	21.6	7-35
Importance of cognitive objectives	40.6	28.0	1-100

(Van der Werf and Weide, 1991, p. 240)

Table 3

- 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

(Levine and Lezotte, 1990, p. 10)

Table 4

- 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

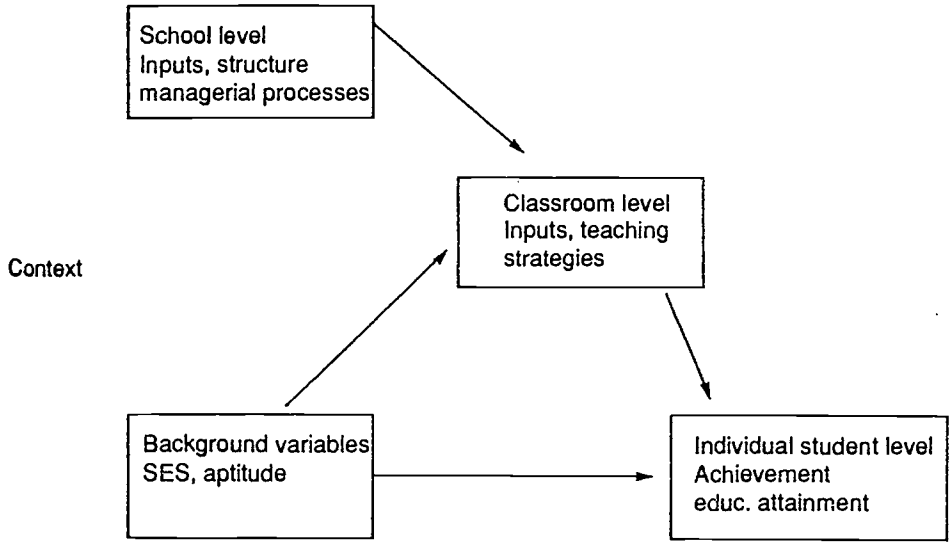
Table 5

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

(Mortimore, Sammons, Stoll, Lewis and Ecob, 1989)

Fig. 2

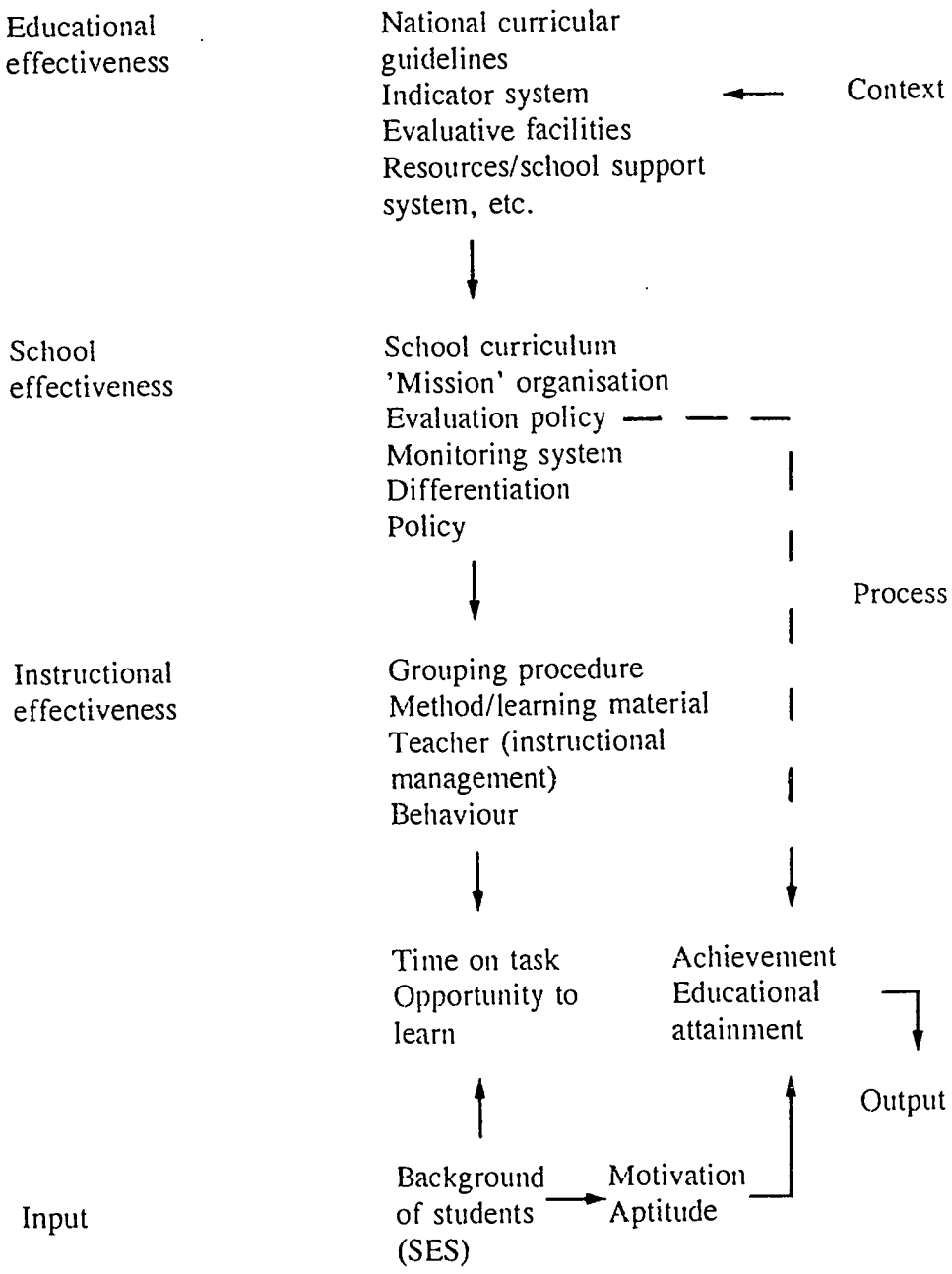
A model of school effectiveness



(Scheerens and Creemers, 1989)

Fig. 3

Conceptual Framework for Educational Effectiveness



(Creemers, 1991)