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CONCEPTUAL AND FORMAL MODELS OF SCHOOL EFFECTIVENESS RESEARCH

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School effectiveness as a field of educational inquiry has been characterized by a strongly empiricist orientation. Reviewers of the state of the art of school effectiveness research, for instance, Mortimore (1992), have pointed at the relative weakness of conceptualization and theory formation.

The models on school effectiveness that are presently available can be characterized as multilevel causal models of educational achievement in basic school subjects. There are three ways in which theoretical and conceptual work in school effectiveness can be advanced:

- connecting the empirical findings of school effectiveness research with more established theories in the social sciences, such as learning theory, cognitive psychology and public choice theory;
- carrying out empirical research that is aimed at hypotheses testing and model building rather than being a "fishing expedition" for positive correlates of achievement;
- bridging the gap between global and rough conceptual models on the one hand and precisely defined formal models (amenable to statistical analysis) on the other.

The symposium aims to contribute to this latter approach.

In the first paper, by Scheerens and Bosker, alternative causal specifications of the "nested layers" image of school functioning are examined. The statistical models that fit these alternative causal specifications are presented, together with a numerical example.

In the second paper, by Van Wieringen, the relationship between environmental administrative arrangements and school effectiveness is the central theme. The author presents a model in which "school autonomy" is a mediating factor between school-environmental arrangements and effectiveness enhancing school characteristics.

Giesbers, in the third paper, presents school organizational models, originating from E. Marx, in which the relationship between school organizational features and degrees of individualized instruction is the major issue. The relevance of these models for the conceptualization and research of school effectiveness is examined.

Obel will present the possibilities of Artificial Intelligence, in casu knowledge-based systems, to improve organizational theory. He formalizes organizational

contingency theory in order to build an expert system (the Organizational Consultant) for organizational diagnoses.

Bosker & Rijpkema present the design characteristics of a knowledge-based system that formalizes contingency theory for education. It is demonstrated how a formalization of this kind can help in theory formation.

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The following questions are addressed in this paper:

- is it useful to think in terms of a comprehensive multilevel school effectiveness model?
- what would be the key-variables of such a model?
- what are the basic explanatory mechanisms behind the interrelationship of factors within the model?
- which are competing causal specifications of the interrelationships?
- which statistical models are appropriate to compare competing causal specifications?

Most current reviews of the school effectiveness literature and proposals for school effectiveness models or even theories appear to accept Barr and Dreeben's basic notion of schools as "nested layers". According to this view the outcomes of one hierarchical level facilitate processes and outputs at the next.

So, for instance, managerial processes at school level are supposed to facilitate conditions of effective instruction at the classroom level. The point we wish to make is that current conceptualizations of school effectiveness that roughly follow this framework are surrounded with considerable vagueness. In the process of attempts to formalize these models, some of this vagueness is likely to become evident and, in some cases, resolved by means of competing specifications.

First of all, the basic notion that conditions at high levels "somehow" facilitate conditions at lower levels can be interpreted in several ways; higher levels can be thought of as:

- providing contexts for lower level conditions made up of aggregates of lower level factors (contextual effects);
- minorng lower level conditions;
- serving as incentives of lower level conditions;
- material facilities for conditions at lower levels;
- overt measures to create effectiveness-enhancing conditions at lower levels (Scheerens, 1992).

Quite likely it will depend on the particular higher level variable which type of facilitating relationship is more plausible than another. The point is that conceptual models should be explicit on the particular interpretation of higher level facilitation. Secondly, an even more basic issue is the question how comprehensive and complex our school effectiveness models should be. "Multilevel" is most likely to mean *four* levels: the level of the individual learner, the classroom level, the school