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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.

CONCEPTUAL AND FORMAL MODELS OF SCHOOL EFFECTIVENESS

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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 Drøebèn'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

level and the immediate environment of the school (municipality, school district, local educational authority etc.).

At each level several relevant antecedent conditions of the ultimate criterion (student achievement) can be discerned. The set of relevant characteristics will become even larger when a broader conception of school organizational effectiveness is used. To avoid a prohibitive proliferation of variables, in our opinion, two mutually enforcing research strategies are to be chosen:

- to test global four-level models on large datasets, in which it is taken for granted that only summary indicators of key-factors are utilized;
- to test more specific two-level models in which more precise measurement of relevant variables is feasible.

In this paper the questions of key-variables and explanatory mechanisms will only be dealt with briefly, referring to other publications in which these issues are dealt with more extensively. We shall produce a list of key-variables as they have been identified in current reviews and mention some explanatory frameworks (didactic models, public choice theory, the cybernetic principle and models of coordination in educational organizations).

When turning to the question of alternative causal specifications within a global framework of schools as nested layers, we discern the following competing models:

additive vs Interactive

According to additive models higher level conditions are seen as increments to variables operating at the lower level; e.g. achievement-oriented policy of an administrative level above the school "adds to" the effects of achievement-oriented policy at school level. In the interactive models higher level conditions impinge on the (causally interpreted) relationship between lower level antecedent conditions and the criterion variable; for instance as when instruction at classroom level is thought of as determining the impact of ability and effort of individual learners. In terms of multilevel modelling the comparison of these two interpretations involves an interest in comparing intercepts (additive model) vs an interest in comparing slopes (interactive model).

recursive vs non-recursive

Negative correlations between variables that are taught to be effectiveness-enhancing and achievement are no exception in school effectiveness research. The inherent ambiguity in correlational research then allows for the interpretation that (e.g.) instructional processes are adapted to achievement levels. In fact, it is not at all implausible that several interrelationships among key-variables of school effectiveness models are in fact non-recursive. Questions about the recursiveness or non-recursiveness of certain interrelationships within school effectiveness models can be tackled in three ways:

- by means of experimental research;
- by means of alternative path-analytical models;
- by means of system-dynamic models.

System-dynamic approaches also bring the important question to the foreground as to which exogeneous factors can "break" repetitive cycles or feedback-loops. Conceptually this issue has to do with the primary "levers" of school effectiveness.

The idea of meta-feedback which originates from the image of the learning organization is also to be tackled by means of this methodology.

contextual vs "genuine" multilevel effects

A basic challenge of the nested-layers perspective on school functioning is the thesis that school effectiveness is largely determined by selection mechanisms (effective schools are schools that attract good students, good teachers and good administrators). "Higher level causation" according to this competing perspective would be largely determined by the contextual effects of aggregates (for instance: weak pupils do better in classes where average achievement is higher). Issues of contextual vs "genuine" multilevel effects can be settled by including both types of variables in multilevel models and by examining the relative magnitude of regression coefficients.

Indirect vs direct causal effects

Conditions that are "more than one level up" with respect to educational achievement can either be seen as direct causes of achievement or as indirectly influencing achievement via intermediate levels. It should be noted that this sort of competing causal models cannot simply be settled by comparing different specifications of the usual LISREL-type or path-analytic models. Instead we would need multilevel path-analytic techniques, which are presently being developed.

additive vs synergetic interpretations

School effectiveness researchers, confronted with very low correlations between their antecedent conditions and achievement, have sometimes sought refuge in the thought that the joint effect of several variables, which individually appear to be of marginal influence, would "do the trick". The question is whether this magic of the whole being more than the sum of its parts is amenable to more precise and formal specification.

Mathematical formalization of each type of competing causal specification as well as a numerical example will be given in the paper.

References

Scheerens, J. (1991). School effectiveness: theory, research and practice. Cassell Publ. (in press).

INSTITUTIONAL CONTEXT, AUTONOMY AND QUALITY OF SCHOOLS

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Especially since the publication of Chubb & Moe's book on Politics, markets and America's schools in 1990 there is considerable debate whether the institutional context of schools does have a direct influence on the quality of schools. Chubb & Moe argue that an effective school organization cannot flourish without substantial school autonomy from direct external control. They make the point that the