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PROMOTING QUALITY AND EQUITY IN EDUCATION: A DYNAMIC THEORY

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INTRODUCTION: HISTORY OF EER

- Early studies were concerned with examining evidence and making an argument about the potential power of schooling to make a difference to students' life chances (Edmonds, 1979).

- This strand of research moved from conducting outlier studies to the use of more sophisticated quantitative approaches that took into account the background characteristics and searched for the impact of schools in student progress (Teddlie & Reynolds, 2000).

INTRODUCTION: HISTORY OF EER

- More emphasis on the quality dimension was given.
- An emphasis to investigating differential teacher and school effectiveness was also given (Strand, 2010).
- The equity dimension was mainly connected with the use of random slope multilevel models that investigate the extent to which teachers are differentially effective in relation to specific groups of students.

Measuring the effectiveness status of schools in relation to equity

However,

These models are not in a position to measure differences in the effectiveness status of schools in relation to equity (Kelly, 2012).

The proposed approach is based on using multilevel modeling techniques to measure the impact that each school can have in reducing the gap on initial measures of student outcomes.

Measuring the effectiveness status of schools in relation to equity

- The reduction of variance of student achievement at two different time points (e.g., at the beginning and at the end of a school year) is estimated at the classroom level.
- This indicator is treated as a dependent variable which can be modeled by taking into account at least two levels (classrooms nested within schools).
- The empty model is used to estimate the contribution of each individual school in promoting equity.

The results that emerged from this analysis can be compared with the multilevel model used to measure the school effectiveness status in terms of quality.

Measuring the effectiveness status of schools in relation to equity

Factors explaining variation of school effectiveness in relation to equity can be identified.

$$d_{jk} = \beta_0 + r_{jk} + u_k + \alpha_1 f_{1k} + \alpha_2 f_{2k}$$ where

j = classroom (or teacher) level

k = school level

$d_{jk} = (varY)_{jk} - (varX)_{jk}$

Y = student achievement at the end of the school year

X = student achievement at the beginning of the school year

$(varY)_{jk}$ = variance of final achievement at classroom level

$(varX)_{jk}$ = variance of initial achievement at classroom level

β_{0jk} = intercept which is random at the level of classroom and school

$f_1, f_2, \ldots f_k$ = factors which explain variation in the contribution of school to the equity dimension

METHODS

Participants

All Grade 5 students (n=2503) from each class (n=108) of 50 primary schools in Cyprus.

Research Instruments

Written tests in mathematics and Greek language were administered both at the beginning and at the end of school year 2004-2005.

- The construction of the tests was subject to controls for reliability and validity.

A **teacher questionnaire** measuring the five dimensions of school policy for teaching and of SLE was administered to all teachers of the school sample.

- The construct validity of the teacher questionnaire was tested by using Structural Equation Modeling (SEM) techniques (Creemers & Kyriakides, 2010).

Follow-up study

- During the school year 2008-2009, a follow-up study measuring teacher and school effectiveness in mathematics and Greek language took place in the same 50 schools where the first study was conducted.
- The methods used were identical to those followed by the first study.

RESULTS

- For each study, separate multilevel analyses concerned with the reduction of the initial gap on achievement in each outcome were conducted.

- The analysis of the data emerged from these studies are presented in Tables 1 up to 4.

Table 1. *Student Achievement in Language in Original Study*

Factors	Model 0	Model 1	Model 2
Fixed part (intercept)	.39 (.05)	.33 (.05)	.19 (.04)
Classroom Level: *Context*			
Variance of socio-economic status (SES)		-.42 (.19)	-.42 (.18)
School Level			
Context			
Variance of socio-economic status		-.11 (.03)	-.11 (.03)
Prior achievement (school mean)		-.29 (.08)	-.29 (.08)
School Factors			
School policy on teaching (stage)			.10 (.04)
School policy on teaching (differentiation)			.10 (.04)
Partnership policy (differentiation)			.09 (.04)
Partnership policy (quality)			.10 (.04)
Teacher collaboration (differentiation)			.11 (.04)
Teacher collaboration (quality)			.10 (.04)
Variance components			
School	25.9%	21.1%	9.1%
Class	74.1%	46.2%	43.2%
Explained		32.7%	47.7%
Significance test			
Loglikelihood	1224.7	1015.2	673.1
Reduction		209.5	342.1
Degrees of freedom		3	6
p value		.001	.001

Table 2. *Student Achievement in Mathematics in Original Study*

Factors	**Model 0**	**Model 1**	**Model 2**
Fixed part (intercept)	.26 (.05)	.22 (.05)	.11 (.04)
Classroom Level: *Context*			
Variance of SES		-.28 (.09)	-.27 (.09)
School Level			
Context			
Variance of SES		-.11 (.03)	-.11 (.03)
Prior achievement (school mean)		-.19 (.06)	-.19(.06)
School Factors			
School policy on teaching (stage)			.12 (.04)
School policy on teaching (differentiation)			.15 (.04)
Partnership policy (quality)			.08 (.04)
Partnership policy (differentiation)			.09 (.04)
Teacher collaboration (differentiation)			.10 (.04)
Teacher collaboration (quality)			.08 (.04)
Learning Resources (quality)			.05 (.02)
Variance components			
School	27.8%	24.1%	9.6%
Class	72.2%	52.1%	46.3%
Explained		23.8%	44.1%
Significance test			
Loglikelihood	824.3	715.2	366.3
Reduction		109.1	348.9
Degrees of freedom		3	7
p value		.001	.001

Table 3. *Student Achievement in Language in Follow-up Study*

Factors	**Model 0**	**Model 1**	**Model 2**
Fixed part (intercept)	.36 (.04)	.30 (.04)	.15 (.04)
Classroom Level: *Context*			
Variance SES		-.25 (.05)	-.25 (.05)
School Level			
Context			
Variance SES		-.13 (.03)	-.13 (.03)
Prior achievement (school mean)		-.18 (.03)	-.19 (.03)
School Factors			
School policy on teaching (stage)			.11 (.04)
School policy on teaching (differentiation)			.12 (.04)
Provision of learning resources (differentiation)			.08 (.03)
Partnership policy (quality)			.08 (.03)
Teacher collaboration (differentiation)			.08 (.04)
Teacher collaboration (quality)			.09 (.04)
Variance components			
School	27.3%	24.2%	10.8%
Class	72.7%	50.6%	41.9%
Explained		25.2%	47.3%
Significance test			
Loglikelihood	763.9	661.7	353.5
Reduction		102.2	308.2
Degrees of freedom		3	6
p value		.001	.001

Table 4. *Student Achievement in Mathematics in Follow-up Study*

Factors	**Model 0**	**Model 1**	**Model 2**
Fixed part (intercept)	.20 (.04)	.17 (.04)	.09 (.04)
Classroom level: *Context*			
Variance SES		-.15 (.05)	-.15 (.05)
School Level			
Context			
Variance SES		-.10 (.03)	-.10 (.03)
Prior achievement (school mean)		-.15 (.06)	-.15 (.06)
School Factors			
School policy on teaching (stage)			.13 (.04)
School policy on teaching (differentiation)			.12 (.04)
School policy on teaching (quality)			.07 (.03)
Partnership policy (differentiation)			.10 (.03)
Teacher collaboration (differentiation)			.08 (.04)
Teacher collaboration (quality)			.09 (.04)
Variance components			
School	28.9%	25.2%	9.2%
Class	71.1%	52.8%	47.0%
Explained		22.0%	43.8%
Significance test			
Loglikelihood	503.9	421.7	144.5
Reduction		82.2	277.2
Degrees of freedom		3	6
p value		.001	.001

RESULTS

- The following factors and their dimensions measuring SLE and school policy for teaching can explain variation of school effectiveness in relation to the equity dimension:

A) Quality, stage and differentiation dimensions of “school policy for teaching”.

B) Quality and differentiation dimension of three aspects of SLE (i.e., collaboration among teachers, collaboration with parents and provision of learning resources).

DISCUSSION

- Qualitative characteristics of the SLE and school policy for teaching can explain variation of school effectiveness in relation to equity.

- These factors were also found to explain variation of school effectiveness in terms of quality (see Hattie, 2009; Kyriakides et al., 2010; Scheerens et al., 2005).

- Differentiation not only in teaching but also in taking actions to improve the SLE and the policy for teaching is supported.

DISCUSSION

- Studies testing the generalizability of these findings are needed.

- Such studies may provide support to school management teams in their attempt to establish school improvement strategies promoting quality and equity in education.

Thank you for your attention

For more information on this project please visit:
www.ucy.ac.cy/equality
or send us an email at kyriakid@ucy.ac.cy