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PROMOTING QUALITY AND EQUITY IN EDUCATION: THE IMPACT OF SCHOOL LEARNING ENVIRONMENT

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INTRODUCTION: THEORETICAL FRAMEWORK

- EER recognizes ***quality*** and ***equity*** as the two dimensions of effectiveness.
- The great majority of effectiveness studies attempt to identify *teacher* and *school level* factors which are associated with student achievement.
- Accountability systems treat the progress made by students as the main criterion for evaluating teachers and schools.
- Some studies reveal that **teachers and schools matter most for underprivileged and/or initially low-achieving students** (Kyriakides, 2004; Scheerens & Bosker, 1997).
- Use of both dimensions of measuring effectiveness – ***quality and equity*** – in building theoretical models of educational effectiveness.
- There is not enough evidence investigating **the relation** between the two dimensions of effectiveness in classrooms, schools, and educational systems (Kelly, 2012; Kyriakides & Creemers, 2011).

INTRODUCTION: THEORETICAL FRAMEWORK

- **Meta-analyses** of studies searching for the impact of school factors (e.g., Hattie, 2009; Kyriakides, Creemers, Antoniou, & Demetriou, 2010; Scheerens, Seidel, Witziers, Hendriks, & Doornekamp, 2005) show that school qualities have causal effects on pupil progress, with variations in schools appearing to affect student achievement.
- The **School Learning Environment (SLE)** is one of the main school factors that have been examined.
- While evidence can be found that schools with favourable environments are academically more successful, ***no study investigating the impact of SLE on the equity dimension of school effectiveness can be identified*.**
- Five dimensions (i.e., ***frequency, focus, stage, quality,*** **and** ***differentiation***) are used to define the SLE and measure its impact on quality and equity.

MEASURING THE EFFECTIVENESS STATUS OF SCHOOLS IN RELATION TO EQUITY

- Using **multilevel modelling techniques** to measure the impact that each school can have in **reducing the gap** on initial measures of student outcomes.

- 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).

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

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

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

A) A Longitudinal Study Investigating the Impact of SLE

Participants:

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

Research Instruments:

- **Written tests in mathematics and Greek language** were administered both at the beginning and at the end of school year 2003-2004
- A **teacher questionnaire** measuring the five dimensions of school policy for improving the SLE was administered to all teachers of the school sample.
  - A generalizability study on the use of teacher responses to each questionnaire item showed that the data can be generalized at the school level.
  - The construct validity of the teacher questionnaire was tested by using Structural Equation Modelling (SEM) techniques.

METHODS

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

Table 1. Parameter estimates and (standard errors) for the analysis of the reduction of variance at classroom level of student achievement in language *(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			
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%	13.1%
Class	74.1%	46.2%	43.2%
Explained		32.7%	43.7%
Significance test			
Loglikelihood	1224.7	1015.2	693.1
Reduction		209.5	322.1
Degrees of freedom		3	4
p value		.001	.001

Table 2. Parameter estimates and (standard errors) for the analysis of the reduction of variance at classroom level of student achievement in mathematics (classrooms within schools) *(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			
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%	12.9%
Class	72.2%	52.1%	46.3%
Explained		23.8%	40.8%
Significance test			
Loglikelihood	824.3	715.2	399.1
Reduction		109.1	316.1
Degrees of freedom		3	5
p value		.001	.001

Table 3. Parameter estimates and (standard errors) for the analysis of the reduction of variance at classroom level of student achievement in language (classrooms within schools) *(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			
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%	14.0%
Class	72.7%	50.6%	41.9%
Explained		25.2%	44.1%
Significance test			
Loglikelihood	763.9	661.7	393.5
Reduction		102.2	268.2
Degrees of freedom		3	4
p value		.001	.001

Table 4. Parameter estimates and (standard errors) for the analysis of the reduction of variance at classroom level of student achievement in mathematics (classrooms within schools) *(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			
Partnership policy (differentiation)			.10 (.03)
Teacher collaboration (differentiation)			.08 (.04)
Teacher collaboration (quality)			.09 (.04)
Variance components			
School	28.9%	25.2%	12.9%
Class	71.1%	52.8%	47.1%
Explained		22.0%	40.0%
Significance test			
Loglikelihood	503.9	421.7	300.5
Reduction		82.2	121.2
Degrees of freedom		3	3
p value		.001	.001

DISCUSSION

- The **quality** and **differentiation** dimensions of the following factors measuring the SLE, explain variation of school effectiveness in relation to the **equity dimension**:

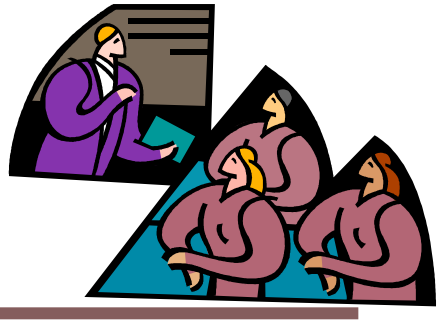
  1. ***collaboration among teachers,***
  2. ***collaboration with parents,***
  3. ***provision of learning resources.***

- 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).

DISCUSSION

- **Differentiation** not only in teaching but also in taking actions to improve the SLE is supported.
- Studies testing the generalizability of these findings are needed.
- School management teams could be supported in their attempt to establish school policies aiming to improve the qualitative characteristics of their SLE and through that to promote 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

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