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# Integrating Research on Teacher Effectiveness with Research on Teacher Professional Development: a Dynamic Approach

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# INTRODUCTION

- Research on **teacher training** and **Educational Effectiveness Research (EER)** have been conducted apart from and without much reference to one another.
  - Few researchers of teacher training methods rationalize their selection of teaching skills in terms of EER and very few evaluate the **impact of teacher professional development on student learning**.
  - Investigators of teacher effectiveness spend little time speculating about the **methods** that may be used to improve teaching practice.
- The *dynamic model of educational effectiveness* has been developed in order to establish links between EER and improvement of practice.

# INTRODUCTION

- An **integrated approach** in defining quality of teaching is adopted.
- The importance of **grouping of factors** has been demonstrated.
- A longitudinal study revealed that the **teacher factors** can be grouped into **five levels** which are situated in a developmental order.
- Taking student outcomes as criteria, teachers who demonstrate competencies in relation to higher levels were found to be more effective than those situated at the lower levels.
- These findings are in line with the assumptions of the **stage models of professional development**.

# INTRODUCTION

- The content of each stage is now specifically determined in terms of **specific teaching skills**.
- Specific **strategies** for improving effectiveness that are more comprehensive in nature may emerge.
- Creemers, Kyriakides & Antoniou (2013) developed the ***Dynamic Integrated Approach (DIA)*** to teacher professional development.
- This approach lies between the two dominant approaches in teacher professional development:
  - the **Competency-Based Approach (CBA)** and
  - the **Holistic Approach (HA)**

# INTRODUCTION

## ***CBA***

- The **CBA** promotes teacher professional development that is concerned each time with **specific teaching skills**.
- A **list of strategies** has been developed by experts which are highly explicit (e.g., how to greet students/praise/ask high level questions).
- Teachers are expected to master **each skill separately**.
- The rather **mechanistic procedure** of providing training to teachers for each skill separately does not allow the critical and creative thinking of the teachers to be expanded nor is taken into consideration at the delivery of such kind of programs.

# INTRODUCTION

## *HA*

- **HA** is focused on encouraging **reflection** of teaching practices, experiences, and beliefs.
- Emphasis is given to approaches involving reflective capabilities of observation, analysis, interpretation, and decision-making which enable teachers to **review critically** their teaching practice.
- HA lacks a **grounded theoretical base** on which specific teaching skills could be developed.
- HA relies on the assumption that reflective practitioners can handle their improvement based solely on their own **experiences and critical thinking**.

# INTRODUCTION

## ***DIA***

- The **DIA** aims to overcome the main weaknesses of both approaches.
- Its content derives from the **grouping of teaching skills** included in the dynamic model and it is differentiated to meet the needs and priorities of teachers at each developmental stage.
- Although the content of the DIA refers to teaching skills that were found to be positively related with student achievement, the participants are also engaged into **systematic and guided critical reflection** on their teaching practices.



# INTRODUCTION

## *Research Aims:*

- This study attempted to **compare the impact of the DIA and the HA** upon teaching skills and student achievement.
- It also investigates the extent to which the impact of each of these two approaches to teacher professional development depends on whether they are offered **internally or externally**.

# METHODS

## *A) Participants*

- A sample of **60 primary schools** was selected and all grade 4-6 teachers (n=334) of the school sample participated in our teacher professional development programs.
- Data were also collected from **all students** (n=7014) of the teacher-sample.
- **Student achievement data** were collected both at the beginning and at the end of the intervention but students with missing final attainment or background data were less than 6% of the original sample and, thereby, they were excluded from each analysis.
- In regard to the teacher sample, only 9 teachers left the experimental study.

# METHODS

## *B) Phases of the study*

### *Phase 1: Initial Evaluation*

- At the beginning of the school year 2010-2011, the **teaching skills** of all teachers of the school sample were evaluated by external observers.
- Using the Rasch and the Saltus models, it was found that teachers could be classified into the same **five developmental stages** emerged from the previous study.

# METHODS

## *Phase 2: The formation of the four experimental groups*

- The schools were randomly assigned to **four groups** (programs of professional development).
- Two of the programs were in line with the **DIA**. One was carried out **externally** and the other **internally** (at school level).
- The other two programs followed the **HA** to teacher professional development. One of them was provided **externally** and the other **internally**.

# METHODS

## *Phase 3: Establishment of training sessions*

### *i) Sessions for teachers employing the DIA*

- The teachers employing the DIA were assigned to **four groups** according to the development stage in which they were found to be situated.
- Supporting **literature and research findings** related with the teaching skills which correspond to their developmental stage were provided.
- The **area** on which each group had to concentrate their efforts for improvement was made clear.
- Each teacher developed his/her own **action plan** by exchanging ideas with the research team and the members of his/her group.

# METHODS

- **One session per month** was scheduled until the end of the school year.
- This decision provided the teachers with sufficient time to implement the activities included in their action plans in their teaching and also to reflect on the effectiveness of these activities, in order to **revise and further develop their action plans**.
- The monthly sessions were organized in groups (based on teachers' stages) and teachers were encouraged to share ideas and teaching materials, to exchange and discuss their experiences and generally to **share the results of their exploration**.

# METHODS

## *ii) Sessions for teachers employing the HA*

- During the first session, teachers had the chance to **discuss in groups**, identify a problem which they considered important in their teaching and formulate a **plan of action** to tackle this problem.
- After the first session and the development of the teachers' initial action plans, we scheduled **one session per month** until the end of the school year.
- The monthly sessions provided the teachers the chance to **revise and develop further their action plans**, based on their own and others' experiences.
- The participating teachers had the chance to report their own teaching practices and comment on them and to **identify effective and non-effective teaching practices**, attitudes and beliefs.

# METHODS

## *Phase 4: Final evaluation*

- By the end of the school year, the teaching skills and student achievement were measured using the same procedure as in *Phase 1* of the study.
- A **final meeting** with all teachers took place in order to get **feedback** about the program.



# RESULTS

**Table 1** Means and standard deviations of teacher scores measuring quality of teaching of each of the experimental groups at the beginning and at the end of the intervention

Group	Beginning of the intervention		End of the intervention	
	Mean	S.D.	Mean	S.D.
Employing DIA externally (n=84)	-0,74*	1,43	-0,32	1,56
Employing DIA internally (n=85)	-0,74	1,47	-0,33	1,63
Employing HA externally (n=82)	-0,76	1,45	-0,76	1,44
Employing HA internally (n=83)	-0,75	1,46	-0,74	1,46

\* Rasch person estimates in logits

# RESULTS

- There was **no statistically significant difference among the four groups** with regard to the initial Rasch person estimates ( $F=0.006$ ,  $p=.999$ ).
- Both groups of teachers employing the **DIA** managed to **improve their teaching skills** (i.e., DIA internally:  $t=10.03$ ,  $df=84$ ,  $p=.001$  and DIA externally:  $t=11.07$ ,  $df=83$ ,  $p=.001$ ).
- Teachers in the two **HA** groups did not manage to improve their teaching skills (i.e., HA externally:  $t=0.32$ ,  $df=81$ ,  $p=.75$  and HA internally:  $t=1.09$ ,  $df=82$ ,  $p=.28$ ).
- A **regression analysis** was also employed.
- $Post\ score = 0.031 + 0.932 * pre\ score + 0.416 * DIA\ External + 0.411 * DIA\ Internal + r$

# RESULTS

## *B) Impact on student achievement gains*

### *Model 1*

- All student background variables had **statistically significant effects on student achievement**.
- With regard to the effect of the teacher background variables, only the length of **teaching experience** was found to be associated with student achievement.

### *Model 2 (impact of quality of teaching)*

- Teachers at stage 3 were treated as reference (or baseline) group and three dummy variables were entered in model 1.
- The **stage** at which a teacher is situated had a **statistically significant effect** on student achievement.

# RESULTS

## *Model 3 (effect of each course)*

- Teachers in the group employing the HA externally were treated as a reference (or baseline) group and three dummy variables indicating the teacher professional approach employed were entered into model 2.
- Only the effect of the two dummy variables measuring the impact of **DIA** was found to be **statistically significant** at .05 level.
- Students of teachers employing the **DIA** either internally or externally managed to obtain **better results** than those of teachers employing the HA.
- The **effect size** of employing the **DIA internally** was as big as the effect size of employing the same approach **externally**.

# DISCUSSION

- This study provides further support to the assumption that **teacher factors are interrelated**.
- Most teachers were found to be situated at the **same stage** after a school year and only some of them managed to move to the next, more demanding stage.
- The **professional needs** of each group of teachers should be taken into account in organizing teacher professional development programs.
- Reflection is more effective when the **improvement priorities** of teachers are taken into account and teachers are encouraged to develop **action plans** which address their **professional needs** rather than let them develop any kind of action plan they like, as it imposed by the HA.

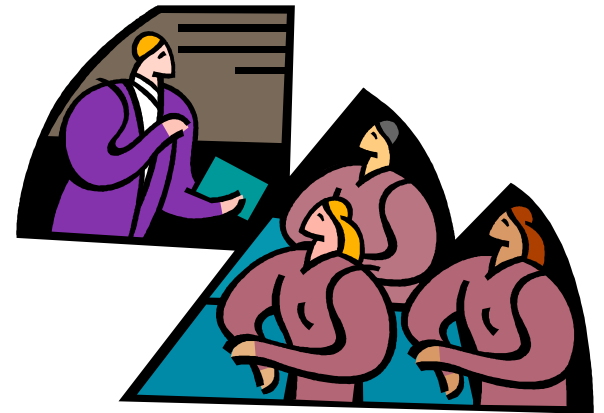
# DISCUSSION

- That is not to deny in any way that **thinking** and **critical analysis are important**, and for this reason those aspects of the HA have been utilized in the development of the DIA.
- When the DIA is provided externally is not less effective than when it is provided internally.
- These two types of interventions had the **same effect** on improving **teaching skills** and on promoting **student learning** outcomes.

# DISCUSSION

- One could claim that the DIA offered externally is more cost effective than the DIA offered internally. However, the only difference in the two groups employing **DIA** had to do with the **setting of the intervention** and thereby when DIA was offered internally only the teacher factors were addressed.
- One could argue that when **DIA is offered internally** and both **teachers and school factors** are addressed we may get stronger effects.
- **Further research is needed** to find out how and under which circumstances the DIA offered at school level can maximize its effects.

Thank you for your attention!





**Table 2** Parameter Estimates and (Standard Errors) for the analysis of student achievement in mathematics (Students within classes, within schools)

Factors	Model 0	Model 1	Model 2	Model 3
<b>Fixed part (Intercept)</b>	-0.59 (0.10)	-0.39 (0.07)	-0.32 (0.07)	-0.25 (0.07)
<b>Student Level</b>				
<u>Context</u>				
Prior achievement in mathematics		0.59 (.12)	0.60 (.11)	0.59 (.12)
SES		0.31 (.11)	0.31 (.11)	0.30 (.10)
Gender (0=boy, 1=girl)		0.09 (.04)	0.09 (.03)	0.09 (.03)
<b>Classroom Level</b>				
<u>Context</u>				
Average achievement		0.34 (.10)	0.34 (.09)	0.34 (.09)
Average SES		0.21 (.08)	0.20 (.08)	0.20 (.08)
Percentage of girls		N.S.S.	N.S.S.	N.S.S.
<u>Teacher background</u>				
Gender (0=male, 1=female)		N.S.S.	N.S.S.	N.S.S.
Years of experience		0.12 (.03)	0.12 (.03)	0.13 (.03)
Position (0=teacher, 1=deputy head)		N.S.S.	N.S.S.	N.S.S.
<u>Quality of Teaching</u>				
Stage 1			-31 (.05)	-30 (.05)
Stage 2			-20 (.05)	-20 (.05)
Stage 4			.16 (.05)	.16 (.05)
<u>Intervention</u>				
HA Internally				N.S.S.
DIA Externally				.14 (.06)
DIA Internally				.15 (.06)
<b>School Level</b>				
<u>Context</u>				
Average achievement		0.12 (.04)	0.11 (.04)	0.11 (.04)
Average SES		0.09 (.03)	0.09 (.03)	0.09 (.03)
Percentage of girls		N.S.S.	N.S.S.	N.S.S.
<b>Variance components</b>				
School	9.0%	7.2%	7.0%	5.8%
Class	15.7%	14.3%	8.5%	7.2%
Student	75.3%	45.0%	44.5%	44.0%
Explained		33.5%	40.0%	43.0%
<b>Significance test</b>				
X <sup>2</sup>	983.8	743.5	631.4	550.1
Reduction		240.3	112.1	81.3
Degrees of freedom		8	3	2
p-value		.001	.001	.001

N.S.S. = No statistically significant effect at level .05