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**ESTABLISHING LINKS BETWEEN TEACHER
EFFECTIVENESS RESEARCH AND TEACHER
PROFESSIONAL DEVELOPMENT:
A DYNAMIC APPROACH**



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INTRODUCTION

- Research has consistently shown that:
 - ▣ the **classroom level can explain more of the variance in pupil outcomes** than the school level, and
 - ▣ a large proportion of this **classroom level variance** can be explained by **what teachers do in the classroom.**

INTRODUCTION

- This presentation aims to:
 - ▣ **summarize key findings** and developments in the area of **TER**
 - ▣ discuss the **main methodological and conceptual limitations of TER**
 - ▣ refer to recent developments in TER which reveal the importance of **identifying grouping of teacher factors** associated with student achievement
 - ▣ propose a **dynamic approach to teacher professional development**
 - ▣ present findings of **experimental studies** supporting its use for improvement purposes

MAJOR FINDINGS OF TEACHER EFFECTIVENESS RESEARCH

- During the last 35 years, researchers have turned to **teacher behaviour as predictor of student achievement** in order to build up a knowledge base on effective teaching.
- 1. ***Quantity and pacing of instruction*** (Amount learnt is related to **opportunity to learn.**)
- Achievement is maximised when teachers **prioritise academic instruction** and allocate available time to **curriculum-related activities.**
- Effective teachers organise and manage the classroom environment as an efficient learning environment and thereby **maximise engagement rates**
 - ▣ Although there is a great deal of teacher talk in the classes of effective teachers, most of it is academic rather than managerial or procedural.

MAJOR FINDINGS OF TEACHER EFFECTIVENESS RESEARCH

2. *Form and quality of teacher's organised lessons* (Giving information – structuring; asking questions (soliciting); and providing feedback)
 - ▣ **Structuring factor:** a) outlining the content to be covered and signalling transitions between lesson parts; b) calling attention to main ideas; and c) reviewing main ideas at the end.
 - ▣ Summary reviews are important since they **integrate and reinforce the learning of major points.**

MAJOR FINDINGS OF TEACHER EFFECTIVENESS RESEARCH

2. *Form and quality of teacher's organised lessons (Giving information – structuring; asking questions (soliciting); and providing feedback)*
 - ▣ **Clarity of presentation**: Effective teachers communicate clearly and directly with their students.
 - ▣ Effective teachers **ask a lot of questions** and attempt to involve students in class discussion.
 - ▣ There should also be a **mix of product and process questions**.
 - ▣ Effective teachers also use **seatwork or small group tasks** since they provide needed practice and application opportunities.

MAJOR FINDINGS OF TEACHER EFFECTIVENESS RESEARCH

3. ***Classroom climate* is a significant teacher factor.**
 - ▣ teacher-student interaction,
 - ▣ student-student interaction,
 - ▣ students' treatment by the teacher,
 - ▣ competition between students,
 - ▣ and classroom disorder.
- ▣ The first two elements are important components of measuring **classroom climate**, as classroom environment research has shown (Cazden, 1986; den Brok, Brekelmans, & Wubbels, 2004; Fraser, 1991).
- ▣ The other three elements refer to the attempt of teachers to **create a businesslike and supportive environment for learning.**

CONCEPTUAL AND METHODOLOGICAL LIMITATIONS OF TER

1. Most effectiveness studies are **exclusively focused on language or mathematics** rather than on the whole school curriculum.
 - ▣ **EER** should take into account the **new goals of education** and related to this their implications for teaching and learning.
 - ▣ **New theories of teaching and learning** should be used in order to specify variables associated with the quality of teaching.
 - ▣ Recent models of teaching and learning characterize **learning as a self-regulated and constructive process** (Bransford, Brown, and Cocking 2000; Collins, Brown, and Newman 1989).

CONCEPTUAL AND METHODOLOGICAL LIMITATIONS OF TER

- During the last decade, this characterization of teaching stimulated a substantial number of studies which investigate the **impact of new learning approaches to teaching on student outcomes** (e.g., Brush, 1997; Nolen, 2003; Fuchs, Fuchs, Yazdian, & Powell, 2002; Ramsden, 1997).
- Two recent **meta-analyses** (Seidel & Shavelson, 2007; Kyriakides & Christoforou, 2011) revealed that instead of treating active and direct teaching approaches as in contrast with the new leaning approaches to teaching, an **integrated approach to teaching should be adopted**.

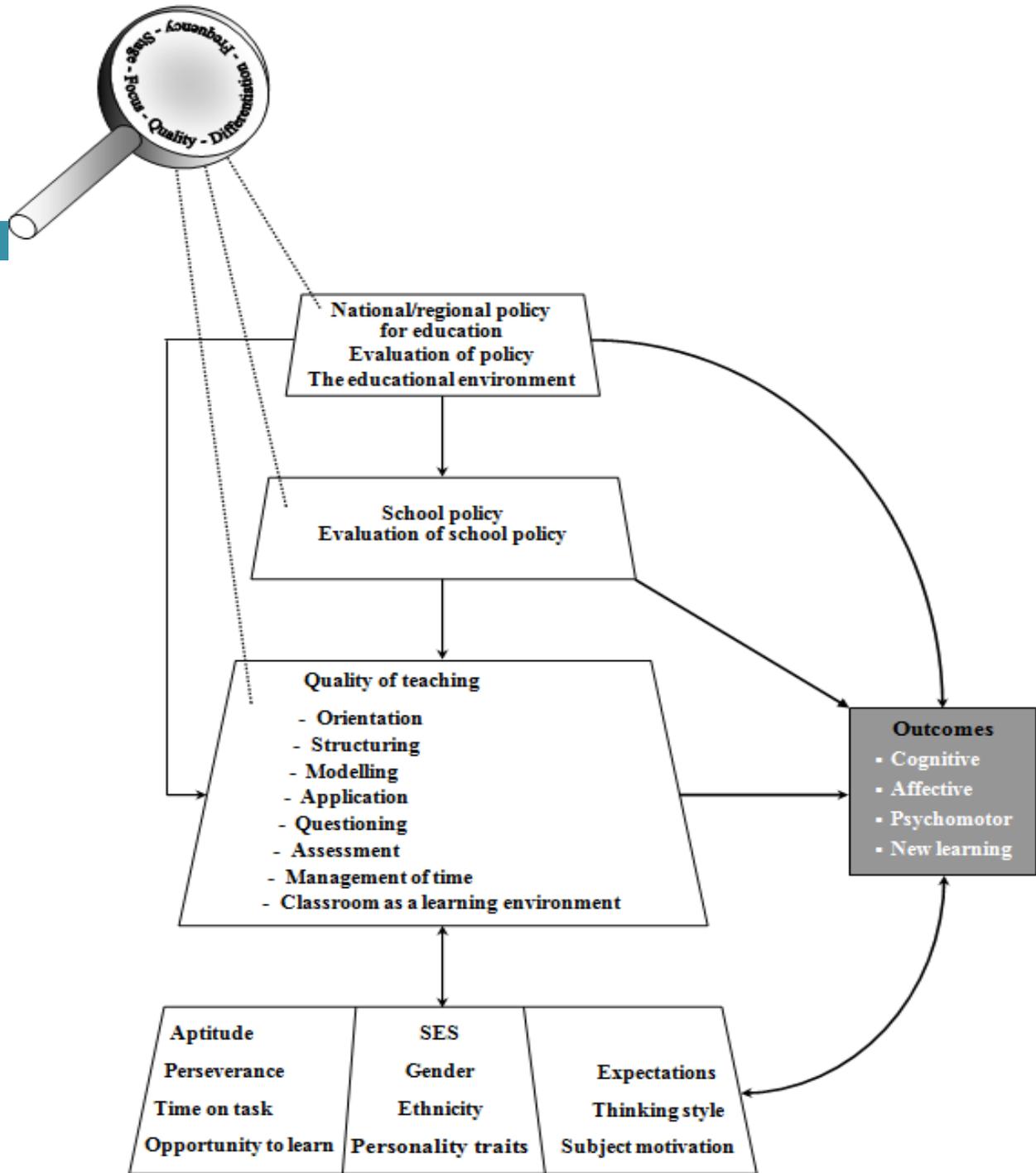
CONCEPTUAL AND METHODOLOGICAL LIMITATIONS OF TER

2. **TER does not contribute significantly to teachers' professional development** or to improving teachers' effectiveness.
 - Research on **teacher training** and research on **teacher effectiveness** have been conducted apart from and **without much reference to one another** (Creemers, Kyriakides, & Antoniou, 2013).
 - ▣ Few researchers of teacher training methods rationalize their selection of teaching skills in terms of TER 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: AN OVERVIEW

- The **dynamic model of educational effectiveness** has been developed in order to establish **stronger links between effectiveness research and improvement of practice** (Creemers & Kyriakides, 2006).
- The dynamic model refers to **multiple factors of effectiveness** which operate **at different levels** (*figure 1*).
- The **teaching and learning situation** is emphasized and the roles of the two main actors (i.e., teacher and student) are analyzed.

Figure 1: The Dynamic Model of Educational Effectiveness



THE DYNAMIC MODEL OF EDUCATIONAL EFFECTIVENESS: AN OVERVIEW

- Although there are different effectiveness factors, each factor can be defined and measured using **five dimensions: *frequency, focus, stage, quality, and differentiation.***
- These dimensions help us describe in better way the functioning of a factor.
- The five dimensions are not only important for a measurement perspective but also and even more for a **theoretical point of view.**
- The use of these dimensions may help us develop **strategies for improving teaching** since the feedback given to teachers could refer **not only to quantitative but also to qualitative characteristics** of their teaching practice.

Table 1: The main elements of each teacher factor included in the dynamic model

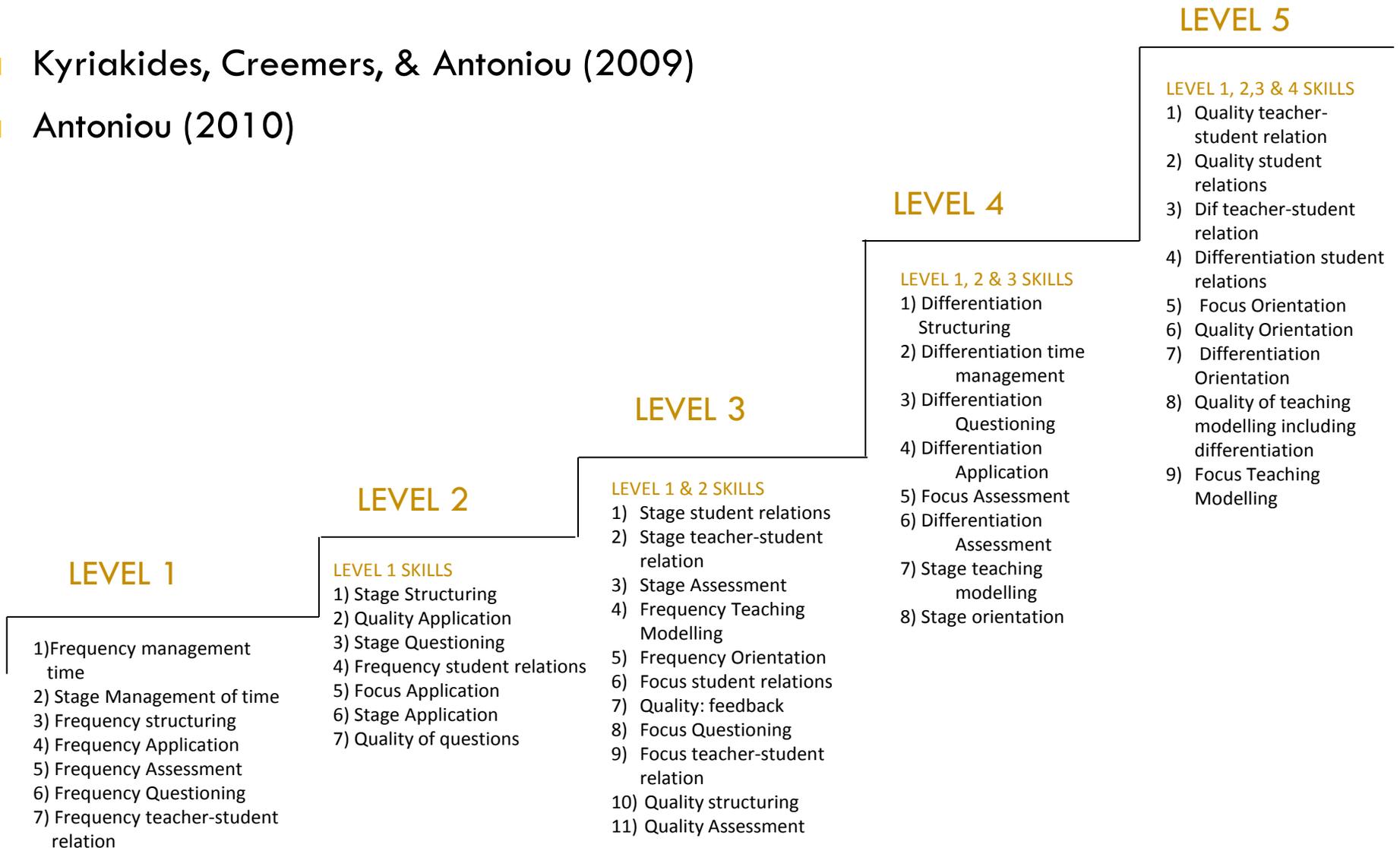
Factors	Main elements
1) Orientation	a) Providing the objectives for which a specific task/lesson/series of lessons take(s) place; and b) challenging students to identify the reason why an activity is taking place in the lesson.
2) Structuring	a) Beginning with overviews and/or review of objectives; b) outlining the content to be covered and signalling transitions between lesson parts; and c) drawing attention to and reviewing main ideas.
3) Questioning	a) Raising different types of questions (i.e., process and product) at appropriate difficulty level; b) giving time for students to respond; and c) dealing with student responses.
4) Teaching modelling	a) Encouraging students to use problem solving strategies presented by the teacher or other classmates; b) inviting students to develop strategies; and c) promoting the idea of modelling.
5) Application	a) Using seatwork or small group tasks in order to provide needed practice and application opportunities; and b) using application tasks as starting points for the next step of teaching and learning.
6) The classroom as a learning environment	a) Establishing on task behaviour through the interactions they promote (i.e., teacher-student and student-student interactions); and b) Dealing with classroom disorder and student competition through establishing rules, persuading students to respect them and using the rules.
7) Management of time	a) Organising the classroom environment; and b) Maximising engagement rates.
8) Assessment	a) Using appropriate techniques to collect data on student knowledge and skills; b) analysing data in order to identify student needs and report the results to students and parent; and c) evaluating their own practices.

THE DYNAMIC MODEL OF EDUCATIONAL EFFECTIVENESS: AN OVERVIEW

- The model is based on the assumption that **teaching factors are not separate entities but some of them are interrelated** (i.e., refers to grouping of factors).
- **Three recent studies** (Kyriakides, Creemers, & Antoniou, 2009; Janosz, Archambault, & Kyriakides, 2011; Antoniou & Kyriakides, 2011) **provided support to this assumption.**
- The teaching skills included in the dynamic model were grouped into **5 stages**. These were situated in a developmental order and linked with student outcomes (*see figure 2*).
- Teachers who demonstrated competencies in the **higher stages** were found to be **more effective than those situated at the lower stages.**

DEVELOPMENTAL STAGES OF TEACHING SKILLS

- Kyriakides, Creemers, & Antoniou (2009)
- Antoniou (2010)



THE DYNAMIC MODEL OF EDUCATIONAL EFFECTIVENESS: AN OVERVIEW

- **The first three levels** are related to the **direct and active teaching approach**, by moving from the basic requirements concerning quantitative characteristics of teaching routines to the more advanced requirements concerning the appropriate use of these skills as these are measured by the qualitative characteristics of these factors.
- These skills also gradually move from the use of **teacher-centred approaches to the active involvement of students**.
- **The last two levels** are more demanding since teachers are expected to **differentiate instruction** (level 4) and demonstrate their ability to use the **new teaching approach** (level 5).
- These five stages advance on previous stage models by specifically **determining the content of each stage** (in terms of teaching skills), whereas previous stage models often lacked clarity on what might constitute each developmental stage.

IMPLICATIONS FOR TEACHER PROFESSIONAL DEVELOPMENT

- A question raised is **the extent to which teachers can move from one stage of teaching competence to the next**, by improving their teaching skills and ultimately their student achievement gains.
- The **dynamic approach** lies between the two dominant approaches to teacher professional development (i.e., the CBA and the HA) and aims to **overcome their main weaknesses**.
 - ▣ **CBA**: Program requirements are stated as competencies which describe what the teacher must demonstrate for successful completion of the program.
 - ▣ **HA**: Promotes reflection of teaching practices, experiences, and beliefs. Reflective practitioners can handle their improvement based solely on their own experiences and critical thinking.

IMPLICATIONS FOR TEACHER PROFESSIONAL DEVELOPMENT

- The 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 this approach 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**.

A STUDY INVESTIGATING THE IMPACT OF THE DYNAMIC APPROACH ON IMPROVING TEACHING AND STUDENT LEARNING OUTCOMES

Participants: A total of **130 primary teachers** volunteered to participate in the professional development programme.

Data were collected for **all students** (n=2356) of the teacher-sample both at the **beginning and end of the intervention**.

Phase 1: Teaching skills were evaluated by external observers.

- Teachers were classified into **the same five levels** mentioned above

Phase 2: The teachers at each developmental stage were randomly **allocated into two groups**.

- The first group employed the **dynamic approach** while the second group used the **HA**.

A STUDY INVESTIGATING THE IMPACT OF THE DYNAMIC APPROACH ON IMPROVING TEACHING AND STUDENT LEARNING OUTCOMES

Phase 3: Teachers of each group began to work towards improving their teaching skills.

*i) Sessions for teachers employing the **Dynamic Approach***

- Teachers employing the DA were assigned to **four groups according to the stage** in which they were found to be situated.
- **Supporting literature and research findings** related with the teaching skills which correspond to their stage were provided.
- The area on which each group had to concentrate their efforts for improvement was made clear.

A STUDY INVESTIGATING THE IMPACT OF THE DYNAMIC APPROACH ON IMPROVING TEACHING AND STUDENT LEARNING OUTCOMES

- Each teacher developed his/her own **action plan** by exchanging ideas with the research team and members of his/her group.
- **One session per month** was scheduled until the end of the school year.
 - ▣ The monthly sessions were **organized in groups** (based on teachers' stages)
 - ▣ Researchers visited teachers at their schools to discuss emergent issues related with the implementation of their action plans into their teaching practice and **provide feedback to the teachers.**

A STUDY INVESTIGATING THE IMPACT OF THE DYNAMIC APPROACH ON IMPROVING TEACHING AND STUDENT LEARNING OUTCOMES

ii) Sessions for teachers employing the HA

- **Primary aim:** Help individuals to **critically evaluate their own beliefs and practice** and help them transform their experiences from a past event to an **ongoing learning process**.
- 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 development of the teachers' initial action plans, we scheduled **one session per month** until the end of the school year.
- This decision provided the teachers with sufficient time to implement the activities included in their action plans and to reflect on the effectiveness of these activities.

A STUDY INVESTIGATING THE IMPACT OF THE DYNAMIC APPROACH ON IMPROVING TEACHING AND STUDENT LEARNING OUTCOMES

Results:

- The **dynamic approach** was more effective than the **HA** in improving teaching skills.
 - ▣ The final scores of **teachers employing the DA** (Mean=0.36, SD=1.05) were **higher than initial scores** (Mean=-0.28, SD=1.01) and this difference was statistically significant ($t=4.14$, $df=64$, $p<.001$).
 - ▣ The final scores of **teachers employing the HA** (Mean=-0.25, SD=1.04) were **not higher than their initial scores** (Mean=-0.26, SD=1.05) and paired samples t-test show that teachers employing the HA did not make any statistically significant progress ($t=0.87$, $df=64$, $p=0.38$).
 - ▣ **None of the teachers employing HA moved from one stage to another.**
- Employing the **DA** had a statistically significant effect on **student achievement**, compared with employing the HA (see Table 2).

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

Factors	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5
Fixed part (Intercept)	5.19 (0.80)	4.10 (0.78)	3.80 (0.80)	3.70 (0.90)	2.90 (0.80)	2.10 (0.80)
Student level						
<u>Context</u>						
Prior achievement in maths		0.80 (.12)	0.79 (.12)	0.81 (.12)	0.80 (.11)	0.80 (.12)
Grade 3		-1.20 (.40)	-1.09 (.40)	-1.08 (.40)	-1.10 (.40)	-1.07 (.40)
Grade 4		-0.72 (.30)	-0.66 (.30)	-0.62 (.30)	-0.63 (.30)	-0.62 (.30)
Grade 6		0.65 (.30)	0.64 (.30)	0.64 (.30)	0.65 (.30)	0.66 (.30)
Sex (0=Girls, 1=Boys)		0.10 (.04)	0.10 (.04)	0.11 (.04)	0.10 (.04)	0.09 (.04)
SES		0.40 (.14)	0.41 (.14)	0.40 (.14)	0.41 (.14)	0.40 (.14)
Cultural capital		0.19 (.08)	0.19 (.09)	0.20 (.08)	0.18 (.08)	0.18 (.08)
<u>Opportunity to learn</u>						
Homework			0.12 (.04)	0.12 (.04)	0.12 (.04)	0.12 (.04)
Private tuition (0 =no, 1=yes)			N.S.S.	N.S.S.	N.S.S.	N.S.S.
Classroom level						
<u>Context</u>						
Average achievement in maths		0.40 (.10)	0.40 (.10)	0.40 (.10)	0.40 (.10)	0.40 (.10)
Average SES		N.S.S.	N.S.S.	N.S.S.	N.S.S.	N.S.S.
Average cultural capital		N.S.S.	N.S.S.	N.S.S.	N.S.S.	N.S.S.
Percentage of girls		N.S.S.	N.S.S.	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				0.08 (.03)	N.S.S.	N.S.S.
Position				N.S.S.	N.S.S.	N.S.S.

Factors	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5
<u>Quality of teaching</u>						
Level 1					-0.52 (.09)	-0.51 (.09)
Level 2					-0.24 (.09)	-0.25 (.09)
Level 4					0.32 (.10)	0.32 (.10)
Experimental group (0=only reflection, 1=DA)						0.24 (.08)
School Level						
<u>Context</u>						
Average achievement in maths		0.09 (.04)	0.10 (.04)	0.08 (.04)	0.10 (.04)	0.09 (.04)
Average SES		N.S.S.	N.S.S.	N.S.S.	N.S.S.	N.S.S.
Average cultural capital		N.S.S.	N.S.S.	N.S.S.	N.S.S.	N.S.S.
Percentage of girls		N.S.S.	N.S.S,	N.S.S,	N.S.S,	N.S.S,
Variance components						
School	10.2%	10.0%	9.8%	9.5%	9.1%	8.5%
Class	18.5%	17.6%	17.2%	16.0%	11.0%	9.0%
Student	72.3%	49.0%	45.0%	44.3%	44.1%	44.0%
Explained		23.4%	28.0%	30.2%	35.8%	38.5%
Significance test						
χ^2	1213.4	687.3	650.1	590.1	520.0	480.5
Reduction		526.1	37.2	60.0	70.1	39.5
Degrees of freedom		9	1	2	2	1
p-value		.001	.001	.001	.001	.001

CONCLUSIONS - SUGGESTIONS

- **Improvement of teacher effectiveness cannot be focused solely on the acquisition of isolated skills or competencies**, or on reflection across the whole teaching process to help teachers get “greater fulfilment as a practitioner of the art” (of teaching).
- **Reflection is more effective when teachers' priorities for improvement are taken into account**, and when they are encouraged to develop **action plans** which address their professional needs.
- Teachers employing the **HA adopted a less focused reflection strategy**, which allowed teachers to reflect on any aspect of their teaching practice irrespective of the stage on which they were situated.

CONCLUSIONS - SUGGESTIONS

- **Thinking** and **critical analysis** are important, and thus those aspects of the HA were utilised in the development of the **DA**.
- Complimenting reflection with the knowledge-base of EER, which addresses the needs of specific groups of teachers, could help establish **effective approaches to teacher professional development** which will have an **impact on improving learning outcomes**.
- Further research is needed to test the generalizability of the findings of these studies and contribute in the **further development of the dynamic approach to teacher professional development**.
- Further research can raise the importance of **addressing not only the teacher but also the school factors** through a dynamic approach which may ultimately have an impact on promoting both **quality** and **equity** in education.

Thank you for your attention!

