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KEYNOTE PRESENTATION

Criteria and Factors of Educational Effectiveness – An Educational Perspective

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INTRODUCTION

- **Educational Effectiveness Research (EER)** attempts to establish and test theories which explain ***why*** and ***how*** some schools and teachers are more effective than others in promoting better outcomes for students.
- The origins of EER stem from reactions to seminal work on equality of opportunity in education that was conducted in the USA and undertaken by Coleman et al. (1966), and Jencks et al. (1972).
  - These two studies claimed that after taking into consideration the influence of student background characteristics only a small proportion of the variation in student achievement could be attributed to the school or educational factors.

INTRODUCTION

- The first two effectiveness studies that were independently undertaken by **Edmonds (1979)** in the USA and **Rutter et al. (1979)** in England during the 1970s were concerned with examining evidence and making an argument about the potential power of schooling to make a difference in the life chances of students.
- The early existence of these two independent research projects in different countries that asked similar questions and drew to a certain extent on similar methodologies demonstrated the potential for establishing a scientific domain dealing with effectiveness in education.
- These two studies were followed by numerous studies in different countries on educational effectiveness.

INTRODUCTION

- **EER** has expanded rapidly during the last four decades in many countries.

- **Methodological advances** have enabled more efficient estimates of teacher and school differences in student achievement to be obtained.

- Progress was made by a more precise **definition** of the concepts used and the **relations** between the concepts.

INTRODUCTION

- **Main Aim of the presentation: *Developing and Testing Educational Effectiveness Theories***
  - Researchers moved from searching for the impact of isolated factors operating at a single level to the development of **integrated models** which refer to factors operating at **different levels** which are associated with different theoretical perspectives of effectiveness.
  - The **dynamic nature of educational effectiveness** is considered in developing the theoretical framework of EER and in using EER for promoting quality and equity in education.

OUTLINE

1. **The Background of Educational Effectiveness Research (EER): Historical Overview**
   - Disciplinary perspectives
   - Moving from single approaches to integrated models
   - Addressing the dynamic nature of education

2. **The dynamic model of Educational Effectiveness: An overview**
   - Rationale - Main characteristics
   - Student level factors
   - Teacher Factors
   - School and System level factors

3. **Testing the validity of the dynamic model**

4. **Suggestions for further research on modelling educational effectiveness**

I. The Background of EER: Modelling Educational Effectiveness

- Researchers attempted to use several theoretical orientations to help explain **why** certain characteristics/factors are associated with **student learning outcomes** (Scheerens & Bosker, 1997).
- Three perspectives within EER were developed and relevant theoretical models emerged:
  - *The **economic perspective***
  - *The **psychological perspective**: Investigating the process of learning*
  - *The **sociological perspective**: Organisational perspectives on effectiveness*

I. The Background of EER: Modelling Educational Effectiveness

A. The economic approach

- Estimating the relationship between the "supply of selected purchased **schooling inputs** and **educational outcomes** controlling for the influence of various background features" (Monk, 1992, p. 308).

- Producing a function which could explain each pupil outcome at a given time.
  - The function may be linear, consisting of main effects and interaction terms or non-linear (Brown & Saks, 1986).

I. The Background of EER: Modelling Educational Effectiveness

A. The economic approach

- The emerging **"education production" models** (e.g., Brown & Saks, 1986; Elberts & Stone, 1988) are based on the assumption that increased inputs will lead to increments in outcomes.

- The research done using these models revealed that the relation between input and outcomes is more complex than was assumed (e.g., Hanushek, 1986, 1989; Hedges, Laine, & Greenwald, 1994).

I. The Background of EER: Modelling Educational Effectiveness

B. ***The psychological perspective: Investigating the process of learning***

- It is mainly focused on variables at **student level**
  - Educational psychologists focused on **student background factors** such as 'learning aptitude', 'personality' and 'motivation,' and on

- Variables measuring the **learning processes** which take place in classrooms.
  - There was an interest in identifying and understanding the features of effective instructional practice and this led to the development of a list of **teacher behaviours** that were positively and consistently related to student achievement over time (Creemers, 1994; Brophy & Good, 1986).

I. The Background of EER: Modelling Educational Effectiveness

c. ***The sociological perspective: Organisational perspectives on effectiveness***

- Focusing on factors that define the **educational and family background** of students, such as SES, ethnic group, gender, social-capital and peer group.

- Studies on the effect of **contextual factors** (Opdenakker & Van Damme, 2006) and on the extent to which teachers and schools are equally effective with **different groups of students** (i.e., differential educational effectiveness) have been conducted (e.g., Campbell et al., 2004; Kyriakides, 2004).

I. The Background of EER: Modelling Educational Effectiveness

c. ***The sociological perspective: Organisational perspectives on effectiveness***

- **Process variables** (such as the school climate, culture, and structure, and contextual variables) associated with **sociological theories of organisation** were treated as school-level factors associated with student achievement.
  - The **structure of procedures** (particularly school management) and **culture**, have received the most emphasis in the practice of empirical effectiveness research, but the empirical basis for the importance of these factors still needs to be strengthened.

II. Educational Effectiveness Theories: Moving from single approaches to integrated models

- **Multilevel integrated models of educational effectiveness developed in the 1990s:** Researchers attempt to integrate the findings of *School Effectiveness Research*, *Teacher Effectiveness Research* and the early *Input-Output Studies*.

- The models of this approach (e.g., Creemers, 1994; Scheerens, 1992; Stringfield & Slavin, 1992) had a ***multilevel structure*** where schools are nested in contexts, classrooms are nested in schools, and students are nested in classrooms or teachers.

II. Educational Effectiveness Theories: Moving from single approaches to integrated models

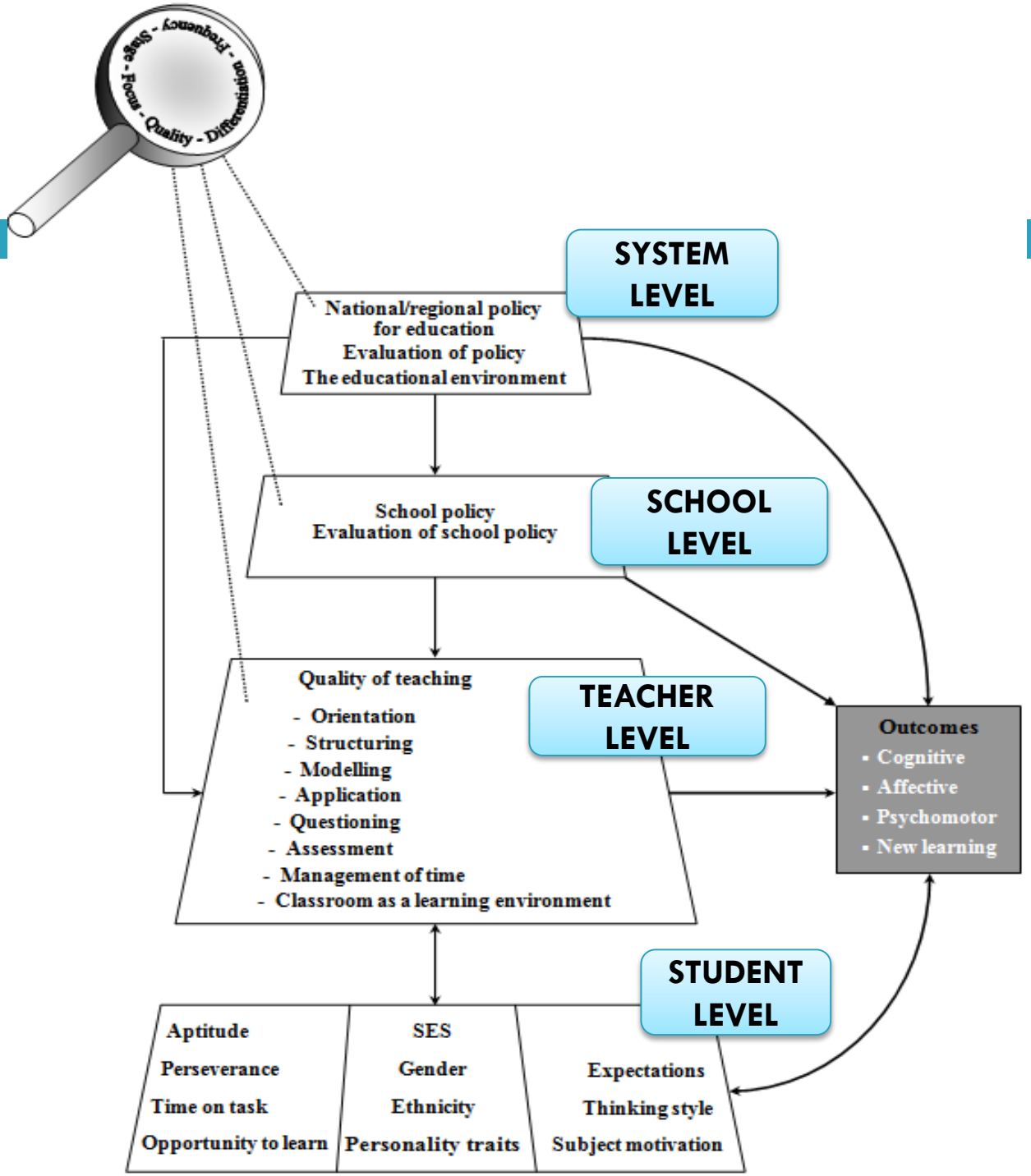
- Although these models made use of organizational theories and theories of learning and refer to multiple factors at different levels, each of them is either focused on the classroom (e.g. Creemers, 1994) or the school level (e.g. Stringfield & Slavin, 1992). Depending on the focus, more emphasis is given either to theories of learning or to organisational theories.

- The **comprehensive model of educational effectiveness** (Creemers, 1994) was considered as one of the most influential integrated models developed in the 1990s (Teddlie & Reynolds, 2000).

II. Educational Effectiveness Theories: Moving from single approaches to integrated models

- Six studies examined the validity of the comprehensive model and provided some **empirical support** to the model (Kyriakides, 2008).
  - These studies also revealed that the relationship between factors at different levels might be more complex than assumed in the integrated models.
  - **Interaction effects** among factors operating at classroom and student level reveal the importance of investigating **differential effectiveness**.
  - A synthesis of these studies has also revealed suggestions for further development of the model especially by taking into account the **dynamic nature of educational effectiveness.**
    - Effective schooling should be treated as a *dynamic, ongoing process*. This idea is also consistent with the contingency theory.

Figure 1: The Dynamic Model of Educational Effectiveness (Creemers & Kyriakides, 2008)



III. Theories of Educational Effectiveness addressing the dynamic nature of education

- Each factor is defined and measured by taking into account five dimensions: ***frequency, focus, stage, quality,*** and ***differentiation.***

- ***Frequency*** refers to the quantity that an activity associated with an effectiveness factor is present in a system, school or classroom. This dimension may not always be related in a linear way with student outcomes.

- The other four dimensions examine qualitative characteristics of the functioning of the factors and help us describe the complex nature of educational effectiveness.

III. Theories of Educational Effectiveness addressing the dynamic nature of education

B. Student level factors

- The dynamic model refers to three categories of student background factors:
  - a) **Sociocultural and economical background variables** emerged from the sociological perspective of EER which are unlikely to change (e.g., gender, SES, ethnicity).
    - These variables are not only treated as student level factors, but also highlight the importance of investigating school effectiveness in terms of the **equity** dimension.

III. Theories of Educational Effectiveness addressing the dynamic nature of education

B. **Student level factors**

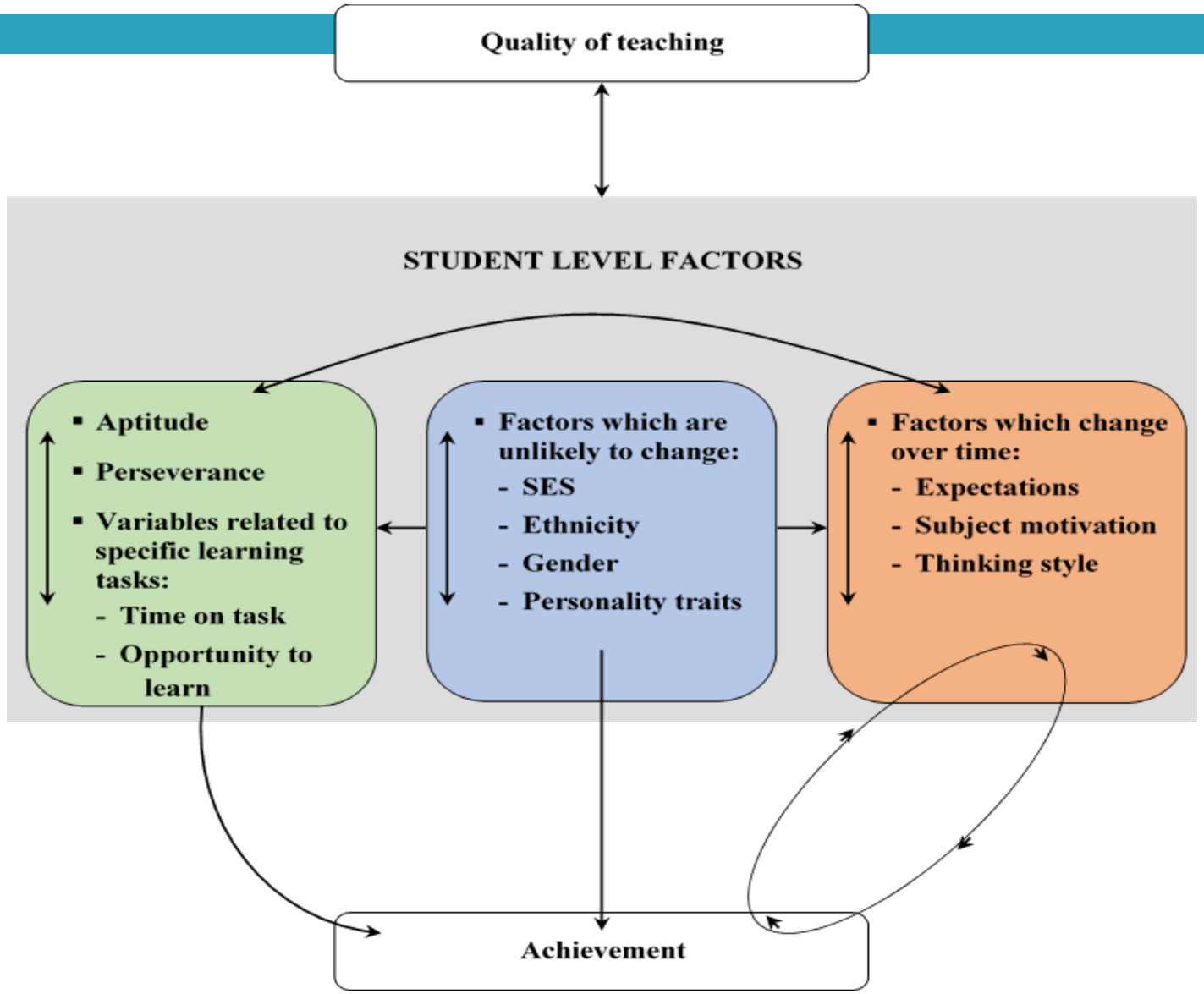
b) **Background variables** emerged from the **psychological perspective** of EER (e.g., subject motivation, expectations, personality, and thinking styles).

- A distinction is made among the student-level factors by referring to factors which are *unlikely to change* and factors that *may change over time*

c) Variables related to specific **learning tasks** emerged from the **psychological perspective** of EER (e.g., Aptitude, Time on Task, Perseverance)

III. Theories of Educational Effectiveness addressing the dynamic nature of education

B. **Student level factors**



c) 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.

III. Theories of Educational Effectiveness addressing the dynamic nature of education

d) School level factors

- The dynamic model places emphasis to two main aspects of the school policy which affect learning: **a) school policy for tea**ching and **b) school policy for creating a learning environment at school.**

- The factors concerned with the school policy mainly refer to the actions taken by the school to help teachers and other stakeholders have a clear understanding of what is expected from them to do.

- Support offered to teachers and other stakeholders to implement the school policy is also an aspect of these two overarching factors.

- The processes which are used to **evaluate the school policy for teaching and the school learning environment (SLE)** are investigated.

III. Theories of Educational Effectiveness addressing the dynamic nature of education

- School policy for **teaching** and actions taken for improving teaching
  1. School policy on **quantity of teaching** (e.g., policy on the management of teaching time, policy on student and teacher absenteeism, policy on lesson schedule and timetable).
  2. School policy on **provision of learning opportunities**
  3. School policy on the **quality of teaching** (orientation, structuring, questioning, modelling, applications, time management, teacher role in making classroom a learning environment, and classroom assessment).

III. Theories of Educational Effectiveness addressing the dynamic nature of education

- Effective schools are expected to:

1. make decisions on maximizing the use of teaching time and the learning opportunities offered to their students,

2. support their teachers in their attempt to help students learn by using effective teaching practices.

III. Theories of Educational Effectiveness addressing the dynamic nature of education

- **Four aspects of the SLE** are taken into account:
  1. student behavior outside the classroom,
  2. collaboration and interaction between teachers,
  3. partnership policy (i.e., relations of school with community, parents, and advisors), and
  4. provision of sufficient learning resources to students and teachers.

III. Theories of Educational Effectiveness addressing the dynamic nature of education

e) **System level factors**

- ***The system level*** refers to the influence of the educational system through a more formal way, especially through developing and evaluating the educational policy at the national/regional level.
- ***Teaching and learning situation*** is influenced by the wider educational context in which students, teachers, and schools are expected to operate.
- Factors, such as the **values of the society for learning** and the importance attached to education, play an important role both in shaping teacher and student expectations, as well as, in the development of the perceptions of various stakeholders about effective teaching practice.

TESTING THE VALIDITY OF THE DYNAMIC MODEL

- Some material supporting the validity of the dynamic model has been produced since 2008, when the model was developed.
- Specifically, **12 empirical studies** and **2 meta-analyses** have been conducted in order to test the main assumptions of the model.
- **Table 2** refers to the studies and meta-analyses which have been carried out and the type of support that each assumption of the model has received from these studies.

Table 2. **Empirical evidence supporting the main assumptions of the dynamic model emerged from empirical studies and meta-analyses**

Assumptions of the dynamic model	Studies	Meta-analyses
1. Multilevel in nature	All	All
2. Five dimensions can be used to measure		
a) teacher factors	1, 2, 4, 5, 7, 11, 12	2
b) school factors	1, 3, 4, 6	1
3. Impact of teacher factors on learning outcomes	1, 2, 4, 5, 6, 7, 11, 12	2
4. Impact of school factors on learning outcomes	1, 3, 4, 6	1
5. Situational character of school factors	1	
6. Relations among factors operating at the same level: stages of effective teaching	1, 5, 6, 7, 8, 9, 10	2
7. Changes in the functioning of school factors predict changes in the effectiveness status of schools	3	
Negative results in relation to any assumption	None	None

Table 2. Empirical evidence supporting the main assumptions of the dynamic model emerged from empirical studies and meta-analyses

Studies:

1. A longitudinal study measuring teacher and school effectiveness in different subjects (Kyriakides & Creemers, 2008a).
2. A study investigating the impact of teacher factors on achievement of Cypriot students at the end of pre-primary school (Kyriakides & Creemers, 2009).
3. A follow-up study testing the validity of the model at the school level (Creemers & Kyriakides, 2010).
4. A European study testing the validity of the dynamic model (Panayiotou et al., 2014).
5. A study in Canada searching for grouping of teacher factors: stages of effective teaching (Kyriakides, Archambault, & Janosz, 2013).
6. An experimental study investigating the impact upon student achievement of a teacher professional development approach based on DASI (Antoniou & Kyriakides, 2011).
7. Searching for the impact and sustainability of the dynamic approach on improving teacher behaviour and student outcomes (Antoniou & Kyriakides, 2013).
8. Searching for stages of teacher's skills in assessment (Christoforidou, Kyriakides, Antoniou, & Creemers, 2014).

Table 2. Empirical evidence supporting the main assumptions of the dynamic model emerged from empirical studies and meta-analyses

Studies:

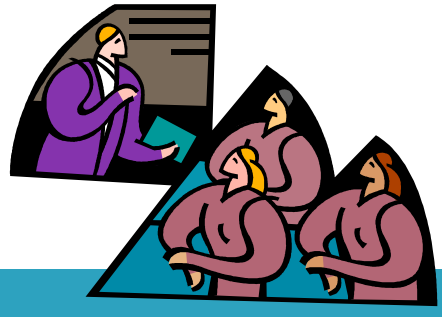
9. The effects of two intervention programs on teaching quality and student achievement (Azkiyah, Doolaard, Creemers, & Van Der Werf, 2014).
10. Using the dynamic model to identify stages of teacher skills in assessment in different countries (Christoforidou & Xirafidou, 2014).
11. Using observation and student questionnaire data to measure the impact of teaching factors on mathematics achievement of primary students in Ghana (Azigwe, Kyriakides, Panayiotou, & Creemers, 2016).
12. Searching for the impact of teacher behavior on promoting students' cognitive and metacognitive skills (Kyriakides, Anthimou, & Charalambous, 2016).

Meta-analyses:

1. A quantitative synthesis of 67 studies exploring the impact of school factors on student achievement (Kyriakides, Creemers, Antoniou, & Demetriou, 2010).
2. A quantitative synthesis of 167 studies searching for the impact of generic teaching skills on student achievement (Kyriakides, Christoforou, & Charalambous, 2013).

SUGGESTIONS FOR FURTHER RESEARCH ON MODELLING EDUCATIONAL EFFECTIVENESS

- Further research to test the **generalisability** of the findings of these studies is needed.
- **Comparative studies** should be conducted in order to find out whether the factors of the model are associated with student achievement in a range of different countries.
  - Comparative studies may also be used to develop the dynamic model at system level further and formulate research questions on the impact of specific national policies on outcomes in different sociocultural contexts.
  - Such studies may eventually contribute to the establishment of the **international dimension of EER** (Reynolds, 2006).



Thank you for your attention!

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