

# Searching for stages of teacher assessment skills to improve assessment practice: A European study

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# Introduction

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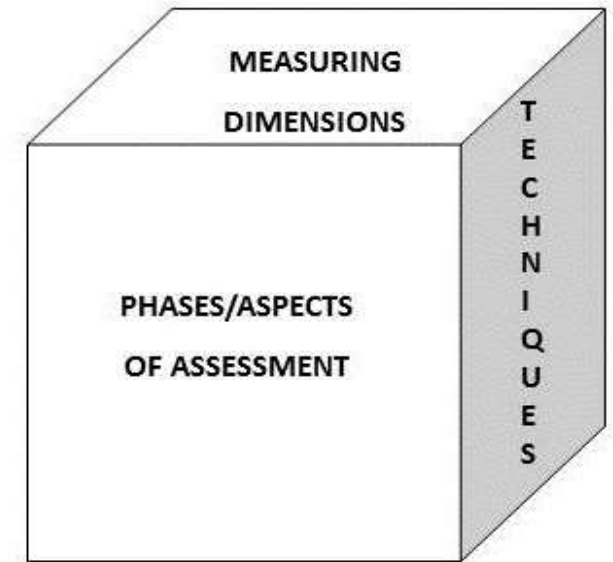
- Prior to any attempt to improve classroom assessment practice; teacher skills in assessment must be examined.
- In order to do so we need to define assessment skills taking in mind the process and the purposes of assessment as these are described in the literature.
- This could then help us design professional development programs that have a positive impact on teachers' assessment practice.

# In this presentation

- **Theoretical framework:** what do assessment skills look like?
- **Methodology:** how to look for developmental stages in assessment skills.
- **Results:** three stages of development in teacher skills
- **Implications:** how can the results of this study inform policy?

# A framework for defining and measuring teacher assessment skills

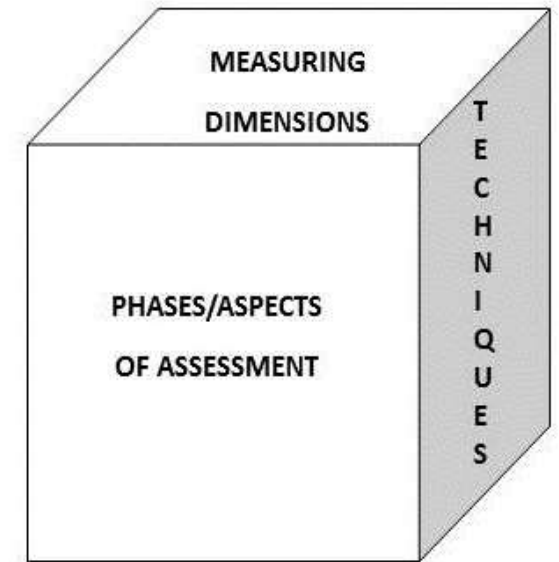
- **Phases of assessment process**
- **Assessment techniques**
- **Measuring dimensions**



(Christoforidou & Xirafidou, 2014; Christoforidou, Kyriakides, Antoniou, & Creemers, 2014).

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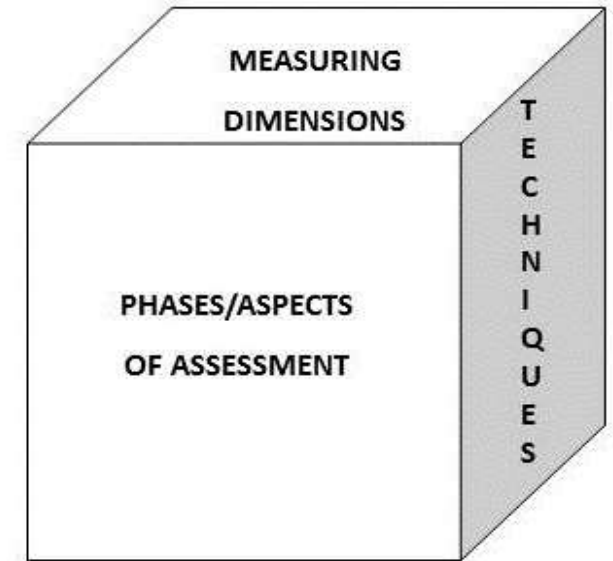
- **Phases of assessment process**
  - *Constructing/ Selecting Assessment Tools/ Processes*
    - *Administering assessment tools/processes*
    - *Recording Assessment Results*
    - *Analyzing, interpreting and using assessment results*
    - *Reporting Results to intended users*
- **Assessment techniques**
- **Measuring dimensions**



(Christoforidou & Xirafidou, 2014; Christoforidou, Kyriakides, Antoniou, & Creemers, 2014).

# A framework for defining and measuring teacher assessment skills

- **Phases of assessment technique**
- **Assessment techniques**
  - *Written assessment*
  - *Oral assessment*
  - *Observation/Performance assessment*
  - *Self-, peer- and co- assessment*
- **Measuring dimensions**

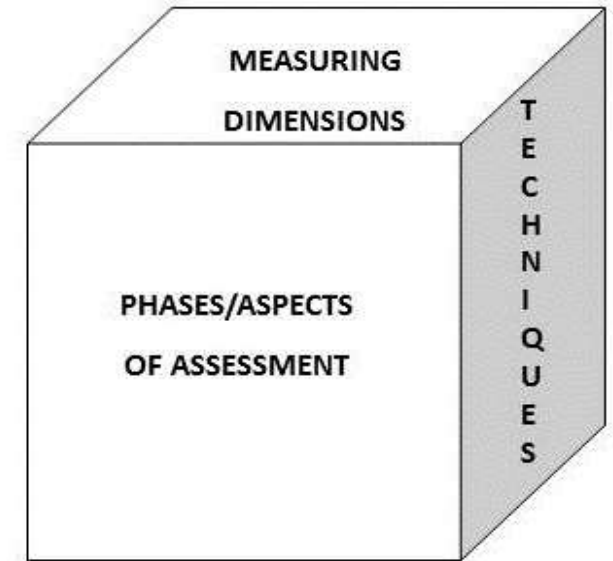


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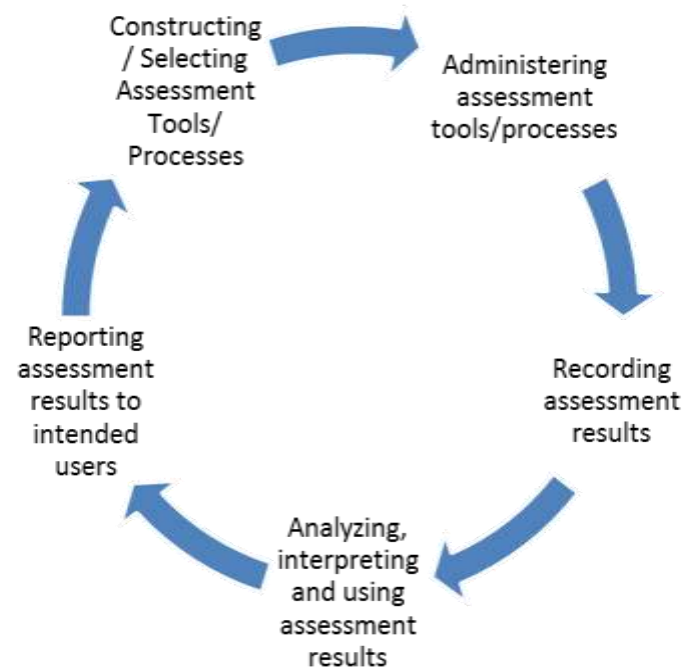
# A framework for defining and measuring teacher assessment skills

- **Phases of assessment technique**
- **Assessment techniques**
- **Measuring dimensions**
  - *Frequency*
  - *Focus*
  - *Stage*
  - *Quality*
  - *Differentiation*



(Christoforidou & Xirafidou, 2014; Christoforidou, Kyriakides, Antoniou, & Creemers, 2014).

# Framework: phases of assessment



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## Assumptions:

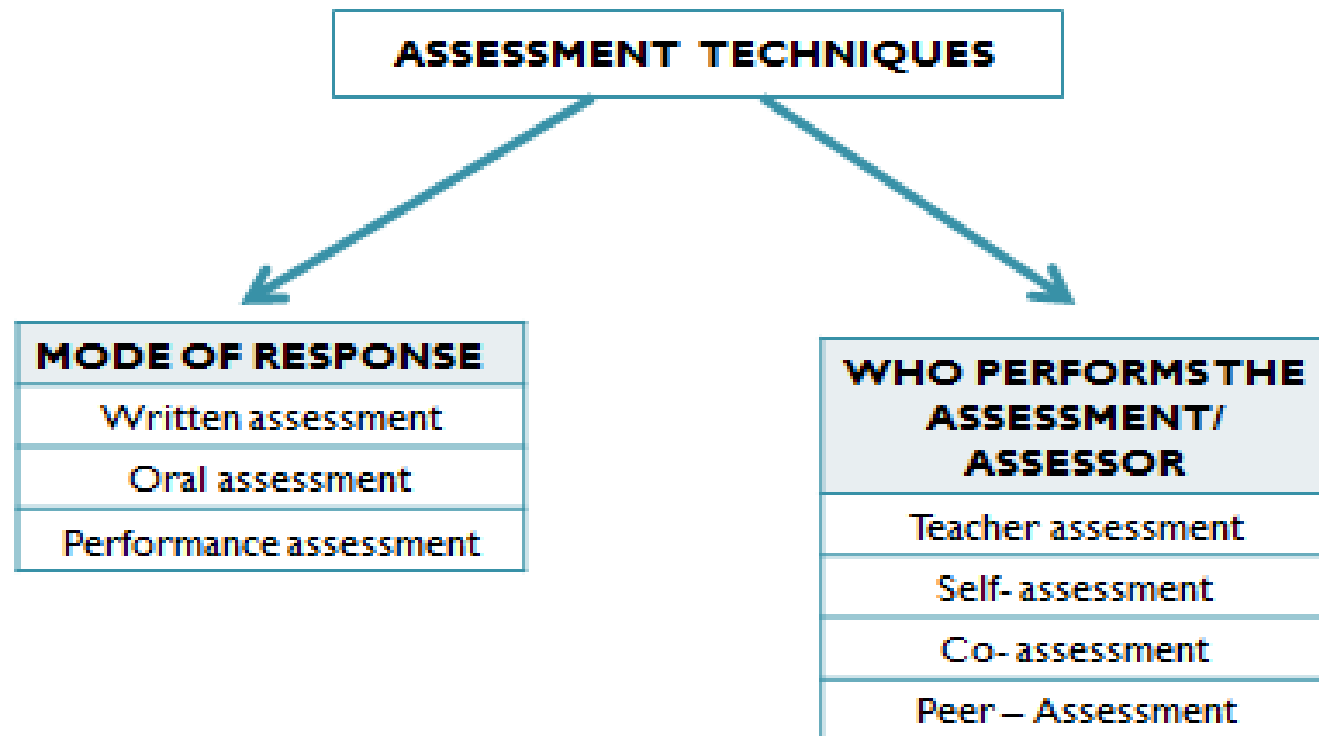
- (i) **quality assessment instruments** are used to collect valid and reliable data;
- (ii) **quality procedures** in administering these instruments are followed;
- (iii) data emerging from assessment are **recorded** in an efficient way and without losing important information;
- (iv) assessment results are **analysed, interpreted and used** in ways that can promote student learning; and
- (v) assessment results are **reported** to all intended users, including parents and students, to help them take decisions on how to improve student learning outcomes.

# Framework: assessment techniques

- Two important decisions: **(1)** mode of response and **(2)** performer of assessment

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**Frequency – focus – stage – quality – differentiation**



# Developing an instruments for this instrument

- **Phases of assessment x assessment techniques x measurement dimensions** = a teacher questionnaire measuring assessment skills
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## Sample items:

“I construct items/exercises/questions for a written test taking into account my students’ abilities(e.g. in a class of lower-ability students I use easier exercises)”

“Once I realize that a student has difficulties in comprehending an exercise, I provide clarifications to that student”

“ I orally assess students to check to what extent the results correspond to the results of the written test”

# Validation of this instrument

- The questionnaire was initially developed in English and a double translation process was used to develop the Greek and the Dutch versions of the instrument.
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Country	Number of Teachers
Belgium	104
Cyprus	188
Greece	96
The Netherlands	186
Total	574

# Methodology

## Questionnaire data-analysis

- The extended logistic model of Rasch and the Saltus model in order to provide answers regarding the scaling and developmental structure of teachers' abilities in assessment.
- Within and across countries analyses were performed.
- Some items were removed to ensure a better fit of the model, with the revised version of the questionnaire including 115 items.

# Methodology

## Questionnaire data-analysis

- The results of the various approaches used to test the fitting of the Rasch model to our data revealed that there was a good fit to the model when teachers' performance in these assessment skills was analysed.

All teaching skills were found to have **item infit** with the range **0.83–1.18**, and **item outfit** with the range of **0.79–1.36**.

All **the values of infit t** for both persons and assessment skills were **greater than - 2.00** and **smaller than 2.00**.

# Methodology

## Using cluster analysis to specify levels of difficulty:

1. The procedure for **detecting pattern clustering** in measurement designs developed by Marcoulides & Drezner (1999) was used to find out whether **assessment skills are grouped into levels of difficulty** that may be taken to stand for **types of teacher behaviour** which move from **relatively easy to more difficult**.

# Methodology

## Using cluster analysis to specify levels of difficulty

2. Applying this method to segment the assessment skills on the basis of their difficulties that emerged from the Rasch model showed that they are optimally clustered into **three clusters**.



# Methodology

## Using cluster analysis to specify levels of difficulty

3. By conducting an across-country analysis, the three-cluster solution emerged as the best solution especially **since this solution was in a position to explain 69% of the total variance.**

# Methodology

## Using the Saltus model to specify the developmental structure of assessment skills

- The Saltus solution was found to represent a better fit to the actual data rather than the Rasch model.
- It offers a statistically significant improvement over the Rasch model which is equal to 391,6 chi-squared units at the cost of 12 additional parameters (i.e., 4 t values, three means, three standard deviations, and two independent proportions).

Assessment Skill	Item dimension	Rasch	Level 1	Level 2	Level 3
<b>Estimates of the Rasch scale</b>					
Freq Co		-2,34	-3,27	-3,27	-3,27
Stage Con	<b>Item difficulty for</b>	-2,32	-3,25	-3,25	-3,25
<b>The difficulty level of these skills is equal for teachers of all 3 stages</b>					
Stage Recording Oral	<b>difficulties</b>	-2,14	-2,88	-2,88	-2,88
Focus Administrat	<b>For level 1 teachers the difficulty level of the skill</b>	-2,13	-2,85	-2,85	-2,85
Quality Constructi	<b>The transition for the other 2 groups is smooth</b>	-1,33	-0,83	-2,77	-2,79
Quality Administra		-1,31	-0,81	-2,73	-2,76
Freq analysis perf		-0,60	-0,06	-1,64	-1,83
Stage analysis performance		-0,60	-0,05	-1,63	-1,82
Quality administration perf/ce		0,73	1,19	0,11	-1,75
Quality reporting performance		0,74	1,19	0,11	-1,76
Stage reporting self		1,81	3,01	1,61	-0,29
Focus recording self		1,89	3,05	1,62	-0,26

# Identification of developmental stages

**Stage 1: Using mainly written assessment to measure achievement in mathematics for summative purposes.**

**Stage 2: Using different techniques of assessment to measure achievement in mathematics but without defining appropriate assessment criteria and providing constructive feedback.**

***Stage 3: Using assessment techniques to measure specific and more complex educational objectives to provide constructive feedback but without involving students in the assessment process and differentiating their assessment practice***

# Identification of developmental stages

## **Stage 1: Using mainly written assessment to measure achievement in mathematics for summative purposes.**

- Use of assessment mainly for summative purposes.
- Use of ready-made assessment tasks. The quality of assessment needs improvement in term of its representativeness and of its internal and content validity.
- Written assessment tasks are usually of the same type which raises questions about their concurrent validity.
- Oral and performance assessment are not systematically used to assess students' learning and assessment tasks used, are mainly written.
- Homework is provided but it is not used for formative purposes (i.e. to identify students' learning needs to inform their teaching practice).

# Identification of developmental stages

## **Stage 2: Using different techniques of assessment to measure achievement in mathematics but without defining appropriate assessment criteria and providing constructive feedback.**

- Teachers give feedback to students about their learning and attempt to use assessment for formative purposes. However, the feedback provided is usually evaluative instead of constructive.
- Use of different assessment techniques to assess students in mathematics but this is not done in a way that enables the comparison of the results which emerge from the use of different types of assessment (internal validity).
- Records of information elicited from written assessment are kept but records instruments such as checklists and rubrics are not often used.
- There is also space for improving their skills in formulating appropriate learning goals and assessment criteria.

# Identification of developmental stages

***Stage 3: Using assessment techniques to measure specific and more complex educational objectives to provide constructive feedback but without involving students in the assessment process and differentiating their assessment practice***

- Use of a variety of assessment techniques to measure students' learning.
- Records are kept regarding information elicited from written assessment and other techniques.
- Recording is usually not done in ways that facilitate the formative use of the information available.
- Assessment of group work but not in a systematic way and usually with a focus on the team's overall performance rather than with each student's contribution to the team.
- Both peer and self-assessment for formative purposes are not yet systematically and efficiently introduced.
- Differentiated assessment practices are not yet introduced

# Identification of developmental stages

- The stages identified in the 1<sup>st</sup> phase of the project (validation study) were used to make decisions in relation to the content and design of the TPD that was implemented during the 2<sup>nd</sup> phase of the FORMAS project (intervention study).
- The developmental scale was consistently identified in both measurement periods (i.e., at the beginning and at the end of the intervention) which provided further support to the initial findings.
- In addition, by comparing the two measurements of participating teachers it was observed that in the cases where change occurred, this change was towards the next demanding level (i.e., from stage 1 to stage 2, from stage 2 to stage 3 etc.).
- This stepwise movement further confirms the developmental character of the assessment skills examined.



# Contribution to policy development

- The theoretical framework and the teacher questionnaire developed allowed us to examine teacher assessment behaviour and identify specific skills involved when assessing students' learning.
- The developmental stages of assessment skills identified are expected to support the project's aims by providing a basis for theory-driven and evidence-based policy decisions.
  - *aid the definition of specific expectations to be met by teachers in relation to assessment.*
  - *help teachers understand how to implement effective assessment in their everyday teaching practice, identify possible shortcomings in their practice, while at the same time holding them accountable.*
  - *guide decisions regarding initial teacher training and professional development.*
  - *enable the identification of teachers' specific needs in assessment for appropriate corrective actions to take place.*
  - *guide the process of gathering data of a teacher's performance for summative or formative evaluation purposes and provide a reliable and unbiased basis for decision making.*

# Thank you for your attention!

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