

The black box revelation of instructional practices:

A MULTI-LEVEL ANALYSIS OF THE TRANSITION TO HE

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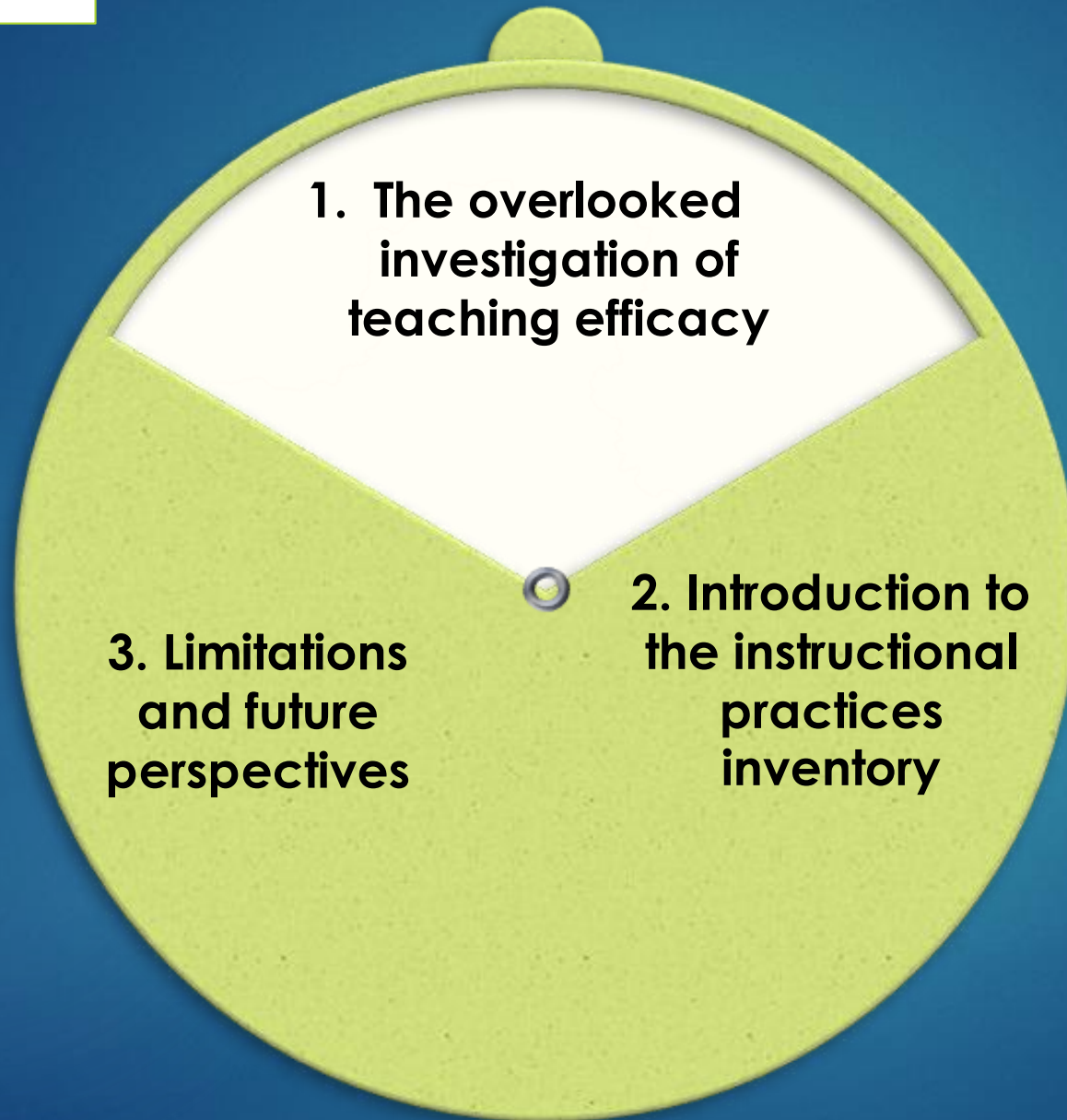
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Structure:

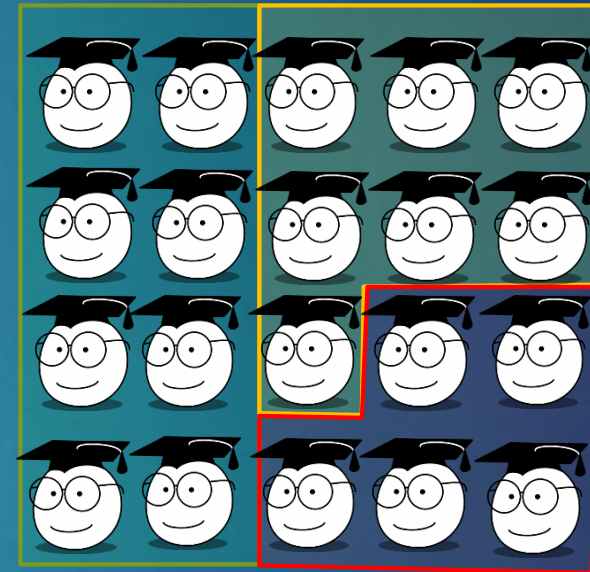
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1.a. Transition to HE is challenging

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- ▶ A challenging transition
 - In Belgium (De Clercq & Perret, 2021):
 - ▶ Fail the year (+/- 41%)
 - ▶ Leave university (+/- 22%)
- ▶ Important number of adjustment challenges (Trautwein & Bosse, 2017)
 - Facing heightened academic requirements
 - Conciliating various aspects of daily-life
 - Developing an autonomous learning
 - Managing the competition
 - Dealing with new administrative rules
 - Building a new social network



1.b. The importance of the learning environment

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► **An extended investigation of the individual predictors of academic achievement** (Richardson, Abraham & Bond, 2012)

- Background characteristics
- Motivation
- Engagement

**Explain +/- 35% of
academic achievement**

► **The promising perspective of the features of the learning environment** (De Clercq, Galand & Hospel, 2021)

► **Could explain +/- 15% of academic achievement**

- **Studies about the course experience** (CEQ; Cano, Pichardo, Berbén, & Fernández-Cabezas, 2021)
- **Situational variables related to interest** (Quinlan, 2019)
- **Literature about active learning and teaching** (Prince, 2004)
- **Descriptive observations of teaching practices** (TDOP; Hora, 2015/ Duguet & Morlaix, 2012)

1.b. 3 limitations of the current investigations

1. **Studies on active teaching and learning**

- ▶ Don't focus on the specific dimensions of teaching practices
- ▶ Didn't identify the effects of these dimensions of teaching on student's achievement

2. **Studies on the course experience**

- ▶ Are based on student's perspective → not a reliable measure of the actual learning environment (Marsh et al., 2012)
- ▶ Are used at the individual level → lack of multi-level investigation of the effects of the aggregated course experience (Lüdtke, Robitzsch, Trautwein, & Kunter, 2009)

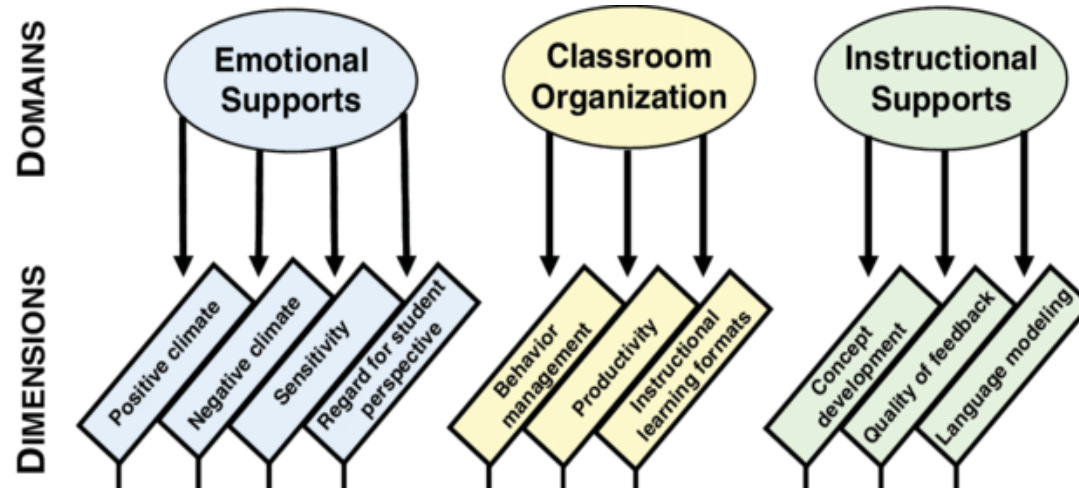
3. **Descriptive observations of teaching practices**

- ▶ Are not based on a strong theoretical model
- ▶ Are mainly descriptive

1.C. Learning from the models of instructional quality

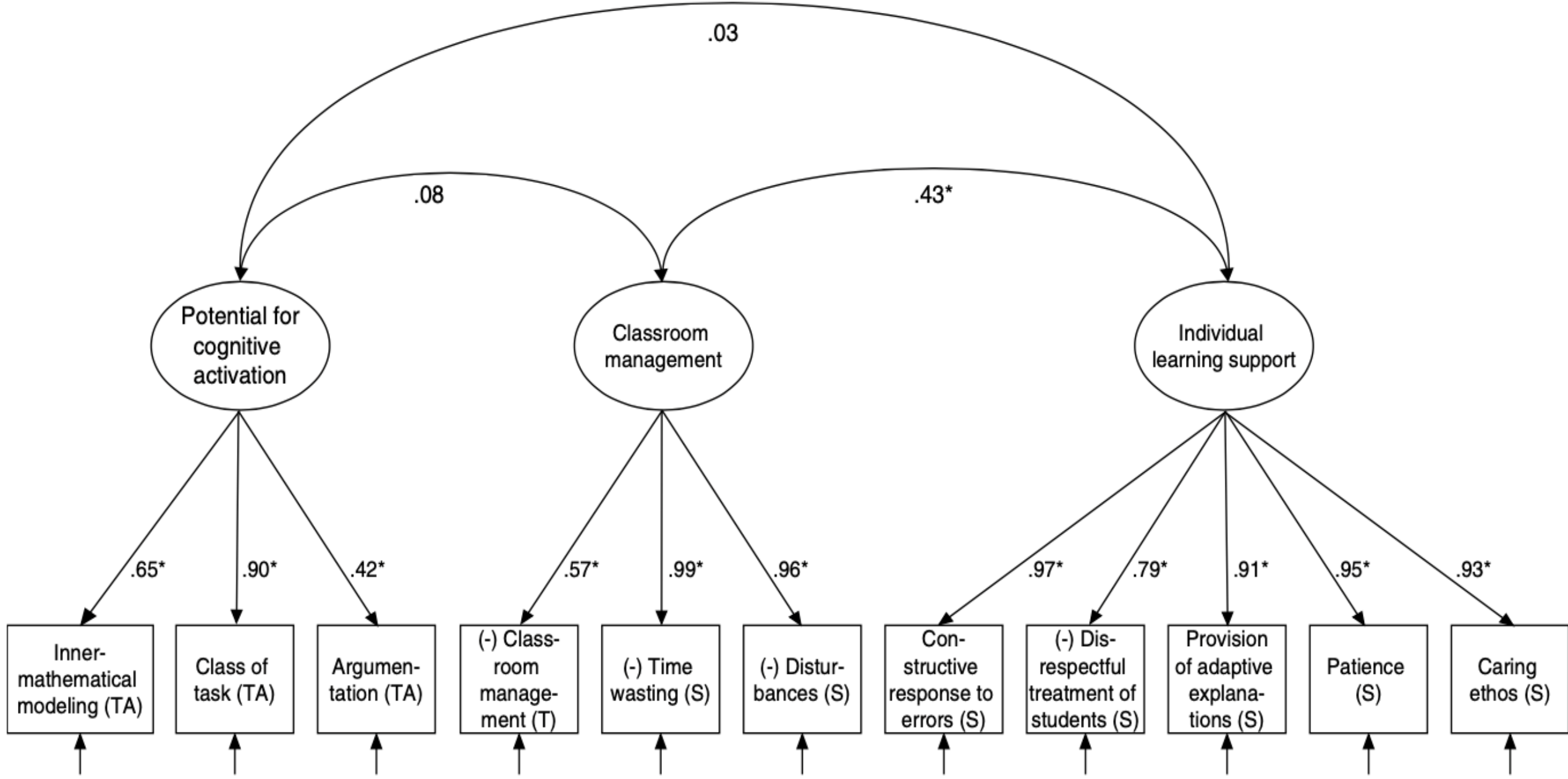
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1. Classroom Assessment Scoring System (CLASS; Pianta & Hamre, 2009)



2. Three Basic Dimensions of instructional quality (Baumert & Kunter, 2013; Praetorius, Klieme, Herbert & Pinger, 2018)

- Cognitive activation
- Classroom Management
- Personal Learning Support



The figure displays standardized loadings. Significant coefficients are indicated with a *.

(-) = scale was reverse coded, (TA) = from the task analysis, (S) = from the student questionnaire, (T) = from the teacher questionnaire.

Model fit: $\chi^2(54) = 173$; $p < .05$; CFI = .978; RMSEA = 0.23.

1.C. Learning from the models of instructional quality

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1. **Classroom Assessment Scoring System** (CLASS; Pianta & Hamre, 2009)

- ▶ Emotional support
- ▶ Classroom organisation
- ▶ Instructional support

2. **Three Basic Dimensions of instructional quality** (Baumert & Kunter, 2013; Praetorius, Klieme, Herbert & Pinger, 2018)

- ▶ Cognitive activation
- ▶ Classroom management
- ▶ Personal learning support

1.d. Aim of the study

► Investigating the role of instructional practices on academic achievement

- Drawing dimensions from models of instructional quality and HE literature
 - **Instructional features**
 - ECTS, number of students, Teacher seniority, teaching format
 - **Teacher's attitudes ($\alpha=.62$ -.78)**
 - Eloquence, teacher sensitivity, constructive approach to error
 - **Teaching practices ($\alpha=.74$ -.85)**
 - Cognitive activation, Classroom management, Provision of structure, Interestingness enhancement

2.a. Method

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▶ Sample

- ▶ N = 932 first-year students from 20 courses
- ▶ 64,2% of female

▶ Measures

- ▶ **Background characteristics** (De Clercq et al., 2017)
 - ▶ Past performance, gender age, SES
- ▶ **Instructional practices** (teacher questionnaire)
 - ▶ Instructional features
 - ▶ Teacher's attitudes ($\alpha=.62-.78$)
 - ▶ Teaching practices ($\alpha=.74-.85$)
- ▶ **Psychosocial variables** (De Clercq et al., 2021)
 - ▶ Self-efficacy beliefs, course value, Surface learning, Deep learning, procrastination, negative emotion ($\alpha=.72-.90$)
- ▶ **Course performance** (mark out of 20)

2.a. Method

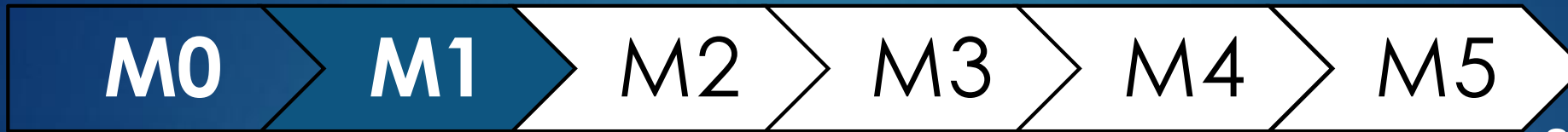


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- ▶ **Procedure** (*Mplus 8*)
 - ▶ **Estimator: robust maximum likelihood (FIML)**
 - ▶ **Multilevel analysis (MLM) allow for 2 levels of analysis**
 - ▶ Level 1: student level → as regular linear regression (within variance)
 - ▶ Level 2: course level → variables aggregated by programs (between variance)
- ▶ **6 steps analytical procedure**
 - ▶ **M0** → Empty model on course performance
 - ▶ **M1** → M0 + Background variables (level 1)
 - ▶ **M2** → M1 + Instructional features (level 2)
 - ▶ **M3** → M2 + Teacher's attitudes (level 2)
 - ▶ **M4** → M3 + Teaching approaches (Level 2)
 - ▶ **M5** → M4 + Psychosocial variables (Level 1)

2.b. Results of M0 and M1

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Parameters	Coefficients
M0	
IIC	0,275
M1	
Intercept	11,608 (0,63)
A. Level 1 Background variables	
1. Gender	-0,024
2. Age	0,034
3. Past performane	0,271***
4. Socioeconomic status	0,181***
*p<.05;**p<.01;***p<.001	

27,5 % of
performance
variance
between the
courses

Within
variance
explained:
11,4%

2.b. Results

M0

M1

M2

M3

M4

M5

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Parameters	Coefficients
M4 = M3 + Teaching practices	
Intercept	11,680 (0,35)
A. Level 1 Background variables	
...	Same effect
B. Level 2 Instructional practices	
3. Teacher seniority	-0,339**
4. Teaching format	0,627***
2. Teacher Sensitivity	-0,044
3. Teacher approach to error	0,353**
1. Cognitive activation	0,129
2. Provision of structure	0,485***
3. Interestingness enhancement	0,384**
4. Classroom Management	-0,221

**Within
variance
explained:
11,4%**

**Between
variance
explained:
89,1%**

2.b. Results

M0

M1

M2

M3

M4

M5

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Parameters	Coefficients
M5 = M4 + Psychosocial variables	
Intercept	11,690 (0,32)
A. Level 1 Background variables	
...	Same effects
B. Level 2 Instructional practices	
T. seniority + format	Same effects
4. Teacher Eloquence	0,346*
2. Provision of structure	0,485***
3. Interestingness enhancement	0,384**
3. Level 1 Psychosocial variables	
2. Procrastination	-0,254***
3. Self Efficay Beliefs	0,326***
4. Surface approach to L.	-0,091*

**Within
variance
explained:
32,4%**

**Between
variance
explained:
94,7%**

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3.a. Conclusion

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- ▶ **Instructional practices provide a complementary perspective on academic achievement**
 - ▶ **27,5% achievement variation among the courses**
 - ▶ **Mainly explained by teaching practices (89,1%)**
 - ▶ Active teaching format have a positive impact on achievement
 - ▶ Teacher seniority has a surprising negative impact on achievement
 - ▶ Teacher attitudes have a positive but unstable effect on achievement (colinearity?)
 - ▶ Among teaching practices, provision of structure and interest are the most important

3.b. Limitations and Future Research

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- ▶ **Only a broad investigation of instructional practices**
 - ▶ Is instructional quality generic or subject-specific? (Schlesinger & Jentsch, 2016)
 - ▶ What about the assessment methods?
 - ▶ Lack of information on the assessment → marks are not based on the same criterion
 - ▶ **Further investigation among similar teaching features is needed**
- ▶ **What about the dimensions identified in our approach?**
 - ▶ Encompassed the dimensions of models of instructional quality but,
 - ▶ Do we miss important dimensions of teaching in HE ?
 - ▶ **The dimensions deserve further validation**
- ▶ **What about the self-reported measure of teaching practices?**
 - ▶ Based on teacher self-reported questionnaire → Reliability (Praetorius et al., 2018)
 - ▶ Which dimensions can be measured through self-reported measure / observation?
 - ▶ **An observation protocol of teaching practices will complement the self-reported questionnaire**

Thank you for watching!

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<https://www.researchgate.net/profile/Mikael-Clercq>

Some related references:

- De Clercq, M., Jansen, E., Brahm, T., & Bosse, E. (2021). From Micro to Macro: Widening the Investigation of Diversity in the Transition to Higher Education. *Frontline Learning Research*, 9(2), 1-8. doi:<https://doi.org/10.14786/flr.v9i2.783>
- De Clercq, M., Galand, B., & Frenay, M. (2020). One goal, different pathways: Capturing diversity in processes leading to first-year students' achievement. *Learning and Individual Differences*, 81, 101908. doi:<https://doi.org/10.1016/j.lindif.2020.101908>
- De Clercq, M., Galand, B., & Frenay, M. (2017). Transition from high school to university: a person-centered approach to academic achievement. *European Journal of Psychology of Education*, 32(1), 39-59. doi:10.1007/s10212-016-0298-5
- Van Meenen, F., De Clercq, M., De Viron, F., & Frenay, M. (2021). Les obstacles académiques à l'ascension vers la réussite: une approche mixte du vécu des étudiants classiques et apprenants adultes. *Orientation Scolaire et Professionnelle*. doi:10.13140/RG.2.2.16534.37449