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TITLE: The malleability of teaching-factors: Context and subject dependencies

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## **Abstract**

Based on a constructivist understanding of teaching and learning, this paper argues for investigating malleable factors (Scheerens, 2014, 2017) in teaching (as opposed to “given”, “endogenous” factors) in the quest for interpreting high quality teaching. It further argues that these factors are largely context and subject-dependent, and that these dependencies are central when it comes to explaining why it has hitherto been so difficult to identify the malleable factors and determine their effect (Johnson 2006; Ferguson & Hirsch 2014; Scheerens 2014, 2017; Borman, Hewes, Overman & Brown 2003; Archer, Kerr & Pianta 2014). The paper illustrates the value of investigating malleable factors focusing on context and subject dependencies through analyses of data from the Tripod Student Engagement Survey (Ferguson, 2012). The data are collected in 2020/2021 in Denmark, Norway, Sweden and Island (N=2.083) as part of the LISA Nordic Study of the Quality in Nordic Teaching (QUINT) project. The paper shows how the students’ perceptions of seven key teaching characteristics: Care, Confer, Captivate, Clarify, Consolidate, Challenge and Control (The 7Cs) differ across different cultural and educational contexts (e.g., nations, courses, and classrooms). The paper contributes with knowledge about the malleability of key teaching characteristics, and it contributes to the discussion of how we can and should understand and examine quality in teaching.

## **Extended summary**

### **Introduction**

There is widespread agreement that institutional factors and treatments (intervention programs and policies, class size, student–staff ratios, indoor environment, length of the school day and teachers’ actions, strategies, and activities) are important for student achievement - and thus are key elements when it comes to teaching quality. Such factors are aspects of schooling and teaching that one can actually change or intervene on, and thus, they can be described as malleable factors as opposed to non-malleable or “given”, “endogenous” factors such as student demographics, previous educational results and teacher experience (Qvortrup & Lykkegaard, 2022; Scheerens, 2017). Although there is agreement that these factors are crucial, it has been difficult to identify specific factors that are reliably related to student achievement (Hanushek, 2011; Rivkin, Hanushek, & Kain, 2005; Rockoff, Jacob, Kane, & Staiger, 2011). Studies suggest that a lack of focus on, and the difficulty of addressing the malleable aspects of teaching are crucial reasons for the lack of progress in the research area of teaching quality (Archer, Kerr, & Pianta, 2014; Borman, Hewes, Overman, & Brown, 2003; Ferguson & Hirsch, 2015; Johnson, 2006; Scheerens, 2014, 2017). In previous work (Qvortrup & Lykkegaard, 2022) we suggest an approach to investigate malleable factors as context and subject dependent constructs, and we show that such constructs can be validly and reliably used in regression analysis to determine the effect of malleable factors. This paper sets out to address the malleability of the teaching-factors addressed in the TRIPOD student engagement survey.

### **Theoretical background**

The TRIPOD student engagement survey addresses seven teaching-factors related to quality teaching, known as the 7Cs (Ferguson, 2012).

Students' responses to the seven teaching-factors are linked to students' achievement and to teaching quality (Ferguson, 2012, p. 24). Rowley, Phillips, and Ferguson (2019) suggests that the 7C factors are stable and thus offer the opportunity to measure teaching quality across contexts (Ferguson, 2012, p. 26) and across time (Rowley et al., 2019). In this paper, we challenge this suggestion of stability of the factors and set out to rethink and redescribe the factors as malleable, referring to a constructivist theoretical framework. Referring to Qvortrup & Lykkegaard (2022), two key points of the constructivist stance will pave the way for this rethinking and redescription: *subject-dependency* and *context-dependency*. These dependencies refer to the understanding that teaching efforts cannot be understood from an objective perspective. Linked to variations in preferences and to previous experiences and from these derived expectations, different individuals perceive teaching differently. Furthermore, teaching and the way it takes shape and is perceived is negotiated in both general and concrete educational and teaching contexts through a complex interplay between the physical and social environment, available resources, traditions, etc., and the malleable factors cannot be understood independently of these different contexts.

### **Aims**

Data from the TRIPOD student engagement survey (addressing the 7C teaching-factors) collected in relation to the LISA Nordic study (part of The Nordic Centre of Excellence project "Quality in Nordic Teaching" (QUINT)) serve as a unique opportunity to investigate the malleability (context and subject dependencies) of teaching-factors. The aim is to understand how the teaching-factors, Care, Confer, Captivate, Clarify, Consolidate, Challenge and Control take form (are perceived and negotiated) across different Nordic contexts.

The paper addresses the following research question:

*Which factors can exploratory be identified in students' perceptions of teaching across different contexts (nations, courses, and classrooms)?*

### **Methods**

#### Data collection instrument

Data were collected based on the TRIPOD student engagement survey (Ferguson, 2012). The survey included 38 items addressing the 7C teaching-factors: Care (5 items), Confer (5 items), Captivate (4 items), Clarify (6 items), Consolidate (4 items), Challenge (7 items) and Control (7 items). Students responded on a five-point Likert scale ranging from 1: Never to 5: Always.

#### Participants

Survey data were collected from 2.083 respondents from four countries (Denmark (N=579), Norway (N=541), Sweden (N=537), and Iceland (n=426)), three subjects (Mathematics (N=809), Language Arts (N=778) and Social Sciences (N=496)) and for 105 classrooms. Some classes answered the TRIPOD student engagement survey for more than one teacher (more than one 'classroom'). In total 997 survey responses from girls and 1.004 from boys (82 missing) were collected.

#### Analysis

Based on Qvortrup and Lykkegaard (2022) and Lykkegaard and Qvortrup (2022) we suggest approaching malleable factors in an open and exploratory way as opposed to confirmatory approaches. We therefore use exploratory factor analysis to investigate the underlying factor structure of the teaching-factors stretched by the Tripod student survey for different contexts (nations, courses, and classrooms).

### **Preliminary findings**

None of the factor analyses for the different contexts investigated result in the 7C-factor structure anticipated from the TRIPOD student engagement survey (Ferguson, 2012). Looking at different nations, we find six factors for Denmark, seven factors for Norway, seven factors for Sweden and eight factors for Iceland. Regarding courses, we find seven factors for Social Sciences, six factors for Language Arts and seven factors for Mathematics. It is striking that, although the factor analyses for some of the countries and courses result in seven teaching-factors, none of these are equivalent to the 7C-factor structure. We discuss the results of the factor analyses, focusing on how they relate to subjective perceptions and national and course traditions. We furthermore discuss how they can be used in additional regression analysis combined with grade or the Protocol for Language Arts Teaching Observation (PLATO) scores (Grossman, Cohen, Chambers Schuldt, & Brown, 2014) to determine the effect of malleable factors on teaching quality.

### **Theoretical and education significance**

The paper contributes with knowledge about contextual differences related to different countries, courses, and classrooms when it comes to the impact from key teaching-factors. Furthermore, the paper contributes with methodological perspectives to the discussion of how we can meet the effort to investigate quality in teaching.

### **Relevance to the QUINT ambition**

The paper will produce new insights into what characterizes teaching quality in Nordic classrooms. In addition, it provides theory- and method-developing perspectives for future research and development work on teaching quality, which consider the changing landscape of Nordic schools.

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