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Validation of inductive code building means by EFA

An example for a mixed methods research approach by using MAXQDA & SPSS

1. Introduction

The strict separation of qualitative and quantitative methods is no longer seen as a stringent necessity in the scientific community. Both paradigms are no longer seen as two disciplines that exclude each other, but as some that complete and complement each other (Gläser-Zikuda, Seidel & Rohlf s et. al. 2012, p. 7). Both combined are seen as a way to answer scientific questions more detailed or even in different ways. This poster presents an example of research project „BerTtram: Belastungsreduktion durch Techniken der Klassenführung – Transfermöglichkeiten“ which deals with questions of school improvement by using mixed methods (Bonsen, Frey & Obermeier 2016, p. 62).

2. Question

Which categories can be summarized?

4.1 Results

Inductive codebuilding
of teachers' associations
with classroom management

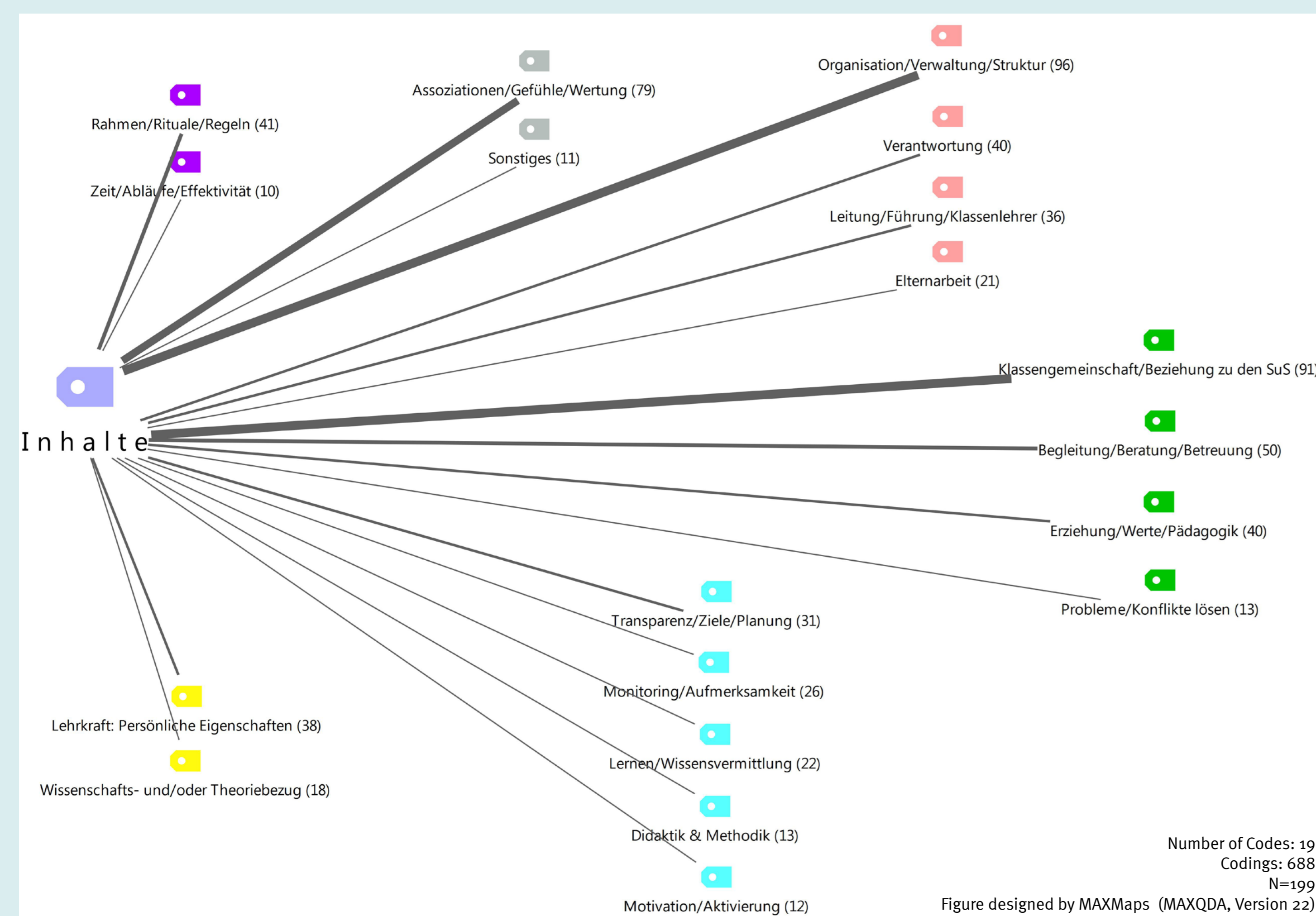


Fig. 01: All codes of teachers' associations with classroom management including frequencies. Sorted by expected factors.

5. Benefit

While the 19 former existing categories were not designed to be used by SPSS, since they display too small case numbers, four or five main codes were built by EFA (Rost 2013, p. 223). The main codes refer to the given factors. It's meant to have a clearer and simpler overlook concerning the amount of variables and their relating case numbers. At last meaningful statistical steps of analysis can be conducted.

6. Discussion

Although some factors can be extracted clearly, single variables do not fit the model. Nevertheless, the way of conducting EFA to sort your qualitative data is a technique that makes you independent of other researchers. It is more efficient compared to teamwork as a technique which is used in order to validate the codings. The team based results can also be controlled additionally by EFA independently.

On the other hand EFA requires a sample size of $N > 200$ (Rost 2013, p. 229). Qualitative research seldom provides such a huge amount of cases, which makes it unattractive for many users. Conducting EFA does not guarantee an output which summarizes factors convincingly. Moreover researchers need to know their data material detailed in order to decide whether the suggested factors are acceptable. Following these guidelines it can be said that the presented technique (EFA) is especially appropriate for mixed methods designs which are characterized by a big number of data material.

3. Methods

Usually EFA (exploratory factor analysis) helps developing scales in a quantitative data set. In this study it was used to find out, which of the vast amount of categories can be summarized as supposed by Mayring (Mayring 2012, p. 31).

199 teachers were asked to write down their associations with „Classroom Management“. Methodically two steps of data analysis had to be done consecutively.

The first one was to sort the noted data material by content analysis (MAXQDA). Since there is no theoretical model of teachers' associations with classroom management, categories were developed inductively. They were built separately and as unambiguously as possible from each other without any hierarchical structure among them. Secondly all categories developed in MAXQDA were transformed into single variables in an SPSS data set to be analysed by EFA.

4.2 Results

Reduction of dimensions
by exploratory factor analysis
(EFA)



Rotated component matrix

Subcodes	Factorloading α							h^2
	I	II	III	IV	V	VI	VII	
Probleme/Konflikte lösen	,703							
Sonstiges	,683							
Assoziationen/Gefühle/Wertung	,619							
Rahmen/Rituale/Regeln		,651						
Lehrkraft: Persönliche Eigenschaften		,527						
Zeit/Abläufe/Effektivität		,492						
Didaktik & Methodik			,774					
Motivation/Aktivierung			,559					,390
Transparenz/Ziele/Planung			,516					
Lernen/Wissensvermittlung				,589				
Begleitung/Beratung/Betreuung				,547				
Wissenschafts- und/oder Theoriebezug				,542				
Klassengemeinschaft/Beziehung z. d. SuS					,669			
Erziehung/Werte/Pädagogik					,668			
Elternarbeit						,692		
Leitung/Führung/Klassenlehrer							,554	,423
Organisation/ Verwaltung/ Struktur				,391			,459	
Verantwortung					,375		,419	
Monitoring/Aufmerksamkeit								,798
% of cumulative variance	8,5%	7,6%	7,3%	7,1%	7,1%	6,8%	6,6%	

Extraction method: Principal component analysis.
Rotation method: Varimax rotation.
Rotation is converged in 13 iterations.

Fig. 02: EFA of all codes of teachers' associations with classroom management.

