



## Research paper

## Patterns in student teachers' learning processes and outcomes of classroom management during their internship

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## H I G H L I G H T S

- Student teachers' classroom management learning process and learning outcomes.
- Four patterns were found, related to knowledge, feedback, inspiration and practice.
- During their internship, student teachers showed broad attention for CM goals.
- The CM outcomes of the four patterns were similar in terms of knowledge and skills.
- Student teachers' attitudes mostly drawn to value (non-)verbal teacher behavior.

## A R T I C L E I N F O

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## A B S T R A C T

Student teachers' classroom management (CM) learning is an important aspect of their teacher education internship. What is still unknown, however, is what the effect of workplace learning is on this development. This study focused on CM learning of 24 student teachers during their internship, looking at their CM goals, CM learning processes, the CM learning outcomes and the interrelationships between these.

Four patterns of student teachers' CM learning processes were found. Moreover, student teachers showed attention for a variety of different CM elements in their learning goals. Similar CM outcomes in terms of knowledge and skills were found in the four patterns. Concerning attitude as an CM outcomes, one statistically significant relation was found between CM learning profile and attitude as a learning outcome. Furthermore, student teachers developed their attitude in terms of 'value of (non-) verbal communication and teacher behavior'.

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## 1. Introduction

Various researchers have emphasized the importance of classroom management (CM) for (student) teachers learning (Evertson & Weinstein, 2006; Emmer & Sabornie, 2015). CM is seen as a core competence for (student) teachers (Emmer & Stough, 2001; Oliver & Reschly, 2007). Furthermore, it is known that effective CM has a significant impact on teacher – pupil relationships and affects pupils' cognitive and affective learning outcomes (Hattie, 2009; Wubbels et al., 2015). However, attention for CM in teacher education curricula is limited and, therefore, researchers argue for more focus on CM in teacher education (Stough, 2006; van Tartwijk

& Hammerness, 2011; Wubbels, 2011).

Looking at the practice of teacher education, not much is known about the role of the school internship in CM learning (Stough & Montague, 2015). Much of what is written about CM learning during the school internship concerns the importance of the internship in gaining CM experience and the needs student teachers have (Stough et al., 2006; Oliver & Reschly, 2007), and on the congruence between the internship and teacher education coursework (Jones, 2006).

In a broader sense, research shows that student teachers' learning in professional development schools (PDS) during their internship, may have a positive effect on student teachers' learning outcomes (Darling-Hammond, 2005; Oliver & Reschly, 2007). As the PDS is an intensified collaboration between teacher education institutes and secondary schools whereby, for instance, teacher education courses are integrated in the context of the workplace,

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student teachers get practical classroom experience and receive supportive feedback. What is still unknown, however, is what the effect of workplace learning within a PDS is on student teachers' CM learning and to what degree this differs between student teachers (Helms-Lorenz et al., 2018; Stough & Montague, 2015). Therefore, the present study focuses on finding patterns in student teachers' CM learning, looking both at the process and outcomes as well as the relations between these elements. Finding an answer will improve teacher educators and researchers understanding on how student teachers learn CM as a competence during their internship. Potential outcomes will give teacher educators and teacher education institutes more insights in how to improve CM learning during the internship, and to anticipate on student teachers' CM learning needs during their teacher education program, both at the teacher education institute as well as the practice school.

## 2. Conceptual framework

In order to conceptualize student teachers' CM learning processes and CM learning outcomes, the three elements of constructive alignment (learning goals, learning processes and learning outcomes) form the starting point of our conceptual framework (Biggs & Tang, 2011). In our conceptual framework, the PDS internship context is the place student teachers' learning took place (see Fig. 1). Concerning learning goals, student teachers' attention for different CM elements will be explored. Regarding the learning process, the use of theory, the role of teacher educators and student teachers' self-regulated learning will be studied, as they are interconnecting concepts of a learning process (Tynjälä, 2008). Then, CM learning outcomes will be studied specifically to look at teacher-student interpersonal relationships and student teachers' learning in terms of knowledge, skills and attitudes. We will explain each of these topics more in detail below.

### 2.1. CM learning goals

The importance of CM as a central concept for the teacher education curriculum is emphasized by many researchers and educators (Evertson & Weinstein, 2006; Emmer & Sabornie, 2015; van

Tartwijk & Hammerness, 2011). CM is often conceptualized as the establishment and maintenance of order and discipline in class, as well as efficiently dealing with disturbances in class (Emmer & Stough, 2001). In line with prior research (Korpershoek et al., 2016; Girardet, 2018), the definition of CM by Evertson and Weinstein (2006) is regarded as a broadly shared definition, and, in this study, is considered to be the basis to conceptualize and categorize the goals and outcomes of student teachers' CM learning. According to Evertson and Weinstein (2006), teachers must, in order to reach a high level of CM, master the following five components: (1) establishing interpersonal relationships with and among pupils, (2) optimizing pupils' access to learning, (3) encouraging pupils' academic engagement, (4) developing pupils' social skills and self-regulation and (5) intervening when behavior problems occur. In this study, this definition of CM serves as a framework to conceptualize CM regarding the learning goals student teachers set in their internship, the learning process student teachers plan, undergo and experience, as well as the learning outcomes they achieve in terms of their knowledge, skills and attitude.

### 2.2. CM learning process: the use of theory and the role of teacher educators

In order to stimulate student teacher learning, especially during the internship period, Zanting et al. (2003) argued that the role of teacher educators and theory are crucial. At the same time, learning at the workplace (e.g. internship school) is more authentic and collegial in nature than learning at the teacher education institute (Tynjälä, 2008). Much is learned from social interactions with colleagues and others at the internship school (Christensen, 2013; Marsick, 2009) in the form of support and feedback from educators, colleagues and peers (Järvelä et al., 2008). As for CM specifically, the role of the teacher educator is often mentioned as being important for student teachers' CM learning in research, as also placing student teachers in classrooms that already have established routines and procedures (Stough & Montague, 2015; Oliver & Reschly, 2007).

In previous research, Adams et al. (2022) distinguished teacher educator roles in those of expert, role model, and mentor. Experts

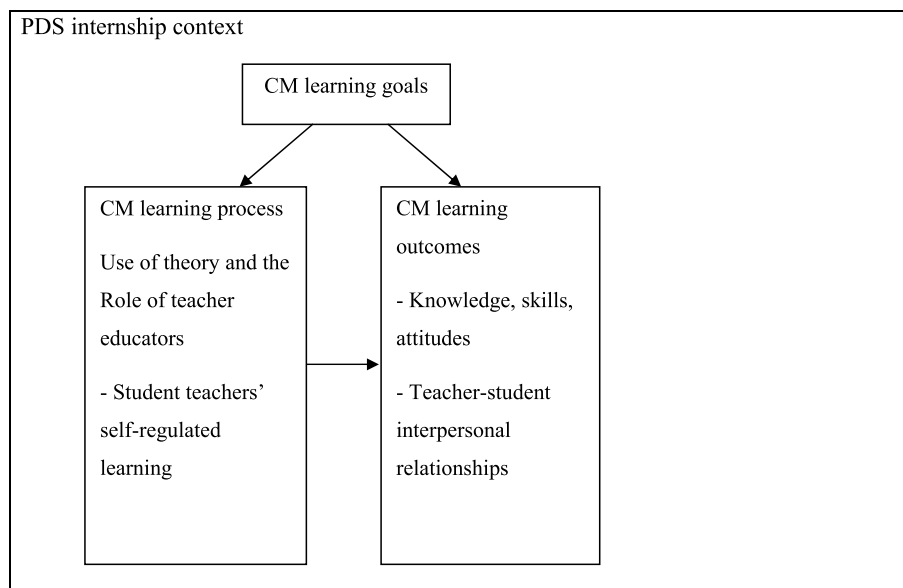


Fig. 1. Conceptual framework of this study.

master both practical knowledge and theoretical knowledge, and are therefore helpful to student teachers when gathering knowledge, discussing practical experiences, and linking those with theoretical knowledge and the practice in the school (Guile & Young, 2003; Loughran, 2006). The role of expert can be found throughout the whole school, as many experts (such as teacher colleagues) are present in that learning environment (Velsen & Volman, 2008). The teacher educator as a role model models his own CM teacher behavior for student teachers, and therefore provides an important, inspiratory role for student teachers (Loughran & Berry, 2005). Moreover, a role model inspires student teachers in their professional development by showing and telling, and discussing teacher behavior with student teachers for them to understand why and wherefore certain actions and teacher behavior were needed (Guile & Young, 2003; Loughran, 2006). The teacher educator as a mentor supports the student teachers to cope with their initial experience in the classroom and also helps them define their own teaching style (Fairbanks et al., 2000). Finally, the mentor observes numerous lessons, provides ongoing feedback and stimulates reflection (Jones, 2006). In doing so, it helps reconstruct student teachers' teaching experiences and relate them to their personal theories of teaching (Fairbanks et al., 2000; van Ginkel, Verloop, & Denessen, 2015).

Another crucial source of student teachers' CM learning during their internship and teacher education trajectory, is the use of knowledge. According to Cochran-Smith and Lytle (1999), a distinction can be made between knowledge of practice and knowledge for practice. Knowledge of practice is conceptual and factual knowledge of pedagogy. This type of knowledge concerns for instance about pupils and their development and learning, and with teaching performance in general (Guile & Young, 2003; Loughran, 2006). In her study, Sjølie (2014) argued that knowledge of practice could be considered as 'theory as foundation', as it structures and enriches professional and practical knowledge, forms a scaffold for teachers and can play an important role in the development of professional expertise. Knowledge for practice on the other hand, is more practical, and serves a more personal, particular and practical goal as it concerns how knowledge can be formed and used in a practical sense (Loewenberg Ball, 2000; Black & Halliwell, 2000). Sjølie (2014) described this as 'prescriptive for practice', as theory can provide specific insights or advise for student teachers in their practice.

2.3. CM learning process: student teachers' self-regulated learning

Self-regulated learning of student teachers is the combination of planning of learning and the active role of the learner (Endedijk et al., 2012). In their study, Endedijk et al. distinguished the way student teachers' planned their learning from the degree of learners' proactivity, and found two dimensions of student teachers self-regulation: (a) passive or active regulation, and (b) prospective or retrospective regulation (based on Pintrich, 2000; Zimmerman, 2000). Active regulation implies that the student teacher makes deliberate choices in relation to the learning goals and strategy, and reflects profoundly on what is learned, the learning process and one's own role. When there is a lack of activity by the student teacher, this regulation is passive. As for the second dimension, in prospective regulation the student teachers actively choose learning goals and strategies; in retrospective regulation, a learning experience is often unplanned, and no active regulation takes place.

2.4. CM learning outcomes

In typifying the content of CM learning outcomes we again used the elements of Evertson and Weinstein (2006), as described above.

Student teachers focus on certain CM goals throughout the internship, which ultimately leads to certain learning outcomes. In order to conceptualize and rank these learning outcomes, the components of competences (knowledge, skills and attitude) will be used, as these components can be developed and are dynamic (Dochy & Nickmans, 2005; Mulder, 2017). Since our previous study showed that teacher-student interpersonal relationships – the first element of Evertson and Weinstein - play a central role in the student teacher period, we have emphasized this element in the present study. Wubbels et al. (2006) claim that this element is essential to other teacher competences. In their research, they used the Model for Teacher Interpersonal Behavior to conceptualize student teachers' CM competence (Wubbels et al., 2015). The model consists of two dimensions: (1) the control or agency dimension, measuring the degree of influence of the teacher, and (2) the proximity or communion dimension, measuring the degree of warmth versus interpersonal distance between teacher and pupils (see also Fig. 2).

Based on the dimensions and sectors, eight teacher profiles can be distinguished: Directive (classroom is well-structured and task-oriented), Tolerant (atmosphere is pleasant and supportive, and pupils enjoy attending class), Tolerant-Authoritative (these teachers maintain a structure that supports pupils' responsibility and freedom), Authoritative (atmosphere is well-structured, pleasant and task-oriented), Uncertain-Tolerant (teachers are cooperative but do not show much leadership in the classroom), Uncertain-Aggressive (classroom is characterized by an aggressive kind of disorder), Repressive (pupils of Repressive teachers are uninvolved and extremely docile) and Drudging (these teachers constantly struggle to managing their class). The profiles Authoritative, Directive, Tolerant and Tolerant-Authoritative can be seen as effective teacher profiles. The others are considered to be less effective teacher profiles. As argued by Wubbels et al. (2006), the profiles Tolerant, Tolerant-Authoritative, Uncertain-Tolerant and Uncertain-Aggressive are the most common profiles for student and starting teachers. These profiles can be characterized by a high amount of communion but a neutral or low amount of agency.

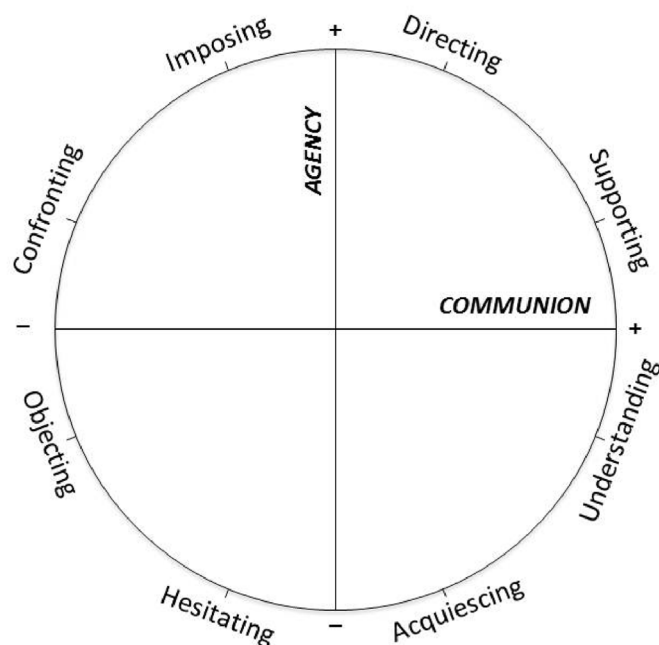


Fig. 2. The model for interpersonal teacher behavior (or teacher interpersonal circle), (Pennings et al., 2014).

Teachers' interpersonal styles are rather stable. Yet, different profiles can be found in different classes, especially with regards to teachers, and teachers might change from type to type during their teaching career (Brekelmans et al., 2005). In this study, the model and profiles are used to accurately map student teachers' CM learning outcomes in terms of the teacher-student relationship.

The relation between student teachers' CM learning processes and CM learning outcomes has not been researched much, as it is hardly mentioned in both Handbooks of Classroom Management (2006; 2015). It seems that little is known about how student teachers' CM learning processes relate to their CM learning outcomes.

The aim of this research is to investigate patterns in student teachers' CM learning processes, student teachers' CM learning outcomes and the relationship between these two elements.

The main research question of this study is: What student teacher CM learning processes and CM learning outcomes can be found during their internship and what patterns emerge in the relationship between these elements?

This question is – based on the aforementioned theoretical framework – specified into the following three sub-questions:

- To what CM components are student teachers' learning goals drawn in their course products?
- What learning processes are visible in student teachers' course products in terms of the use of theory, the role of teacher educators and student teachers' self-regulated learning?
- What CM learning outcomes are visible in terms of student teachers' knowledge, skills, attitudes and student perceptions of the teacher-student interpersonal relationship?
- What learning patterns can be discerned in student teachers' learning processes and how do these patterns relate to student teachers' CM learning outcomes?

### 3. Method

#### 3.1. Context of the study

This study was conducted in the context of a network of professional development schools (PDS). Recent studies have provided indications that PDS contexts in general show better results in terms of student teacher development than non-PDS practice schools (Helms-Lorenz et al., 2018). In the PDS network, teacher education courses are integrated in the context of the workplace at a PDS. At non-PDS, schools no teacher education curriculum components are taught in the school context. Moreover, supervising teachers at PDS schools receive training from the university and obtain paid time from school management for student teacher supervision.

#### 3.2. Participants

A group of 36 fourth year student teachers was selected, who were in the final stage of their teacher education program of one University of Applied Science and did an their internship at a PDS. These student teachers all worked and studied within the same PDS-network. The student teachers selected for this research were asked to participate in the research, but were also free to refuse or stop cooperation at any time. Data provided by them after agreeing to participate (see *Instruments*) was coded anonymously and stored in a digital data depository. Six student teachers suffered some delays during their internship, or even quitted their internship. Six student teachers refused to cooperate in this study. A wide range of valuable data was collected from the remaining 24 student teachers, who all participated in this study. More details regarding their

school subject and gender are presented in the table below. During the entire academic year from September until June, student teachers worked in the context of their internship. Similar to other teachers at the schools, these student teachers were responsible for and taught their own classes..

#### 3.3. Instruments

In order to study student teachers' CM learning processes and CM learning outcomes, course assignment outcomes of students in the fourth-year curriculum of the teacher education institute were analyzed, taken from the professional development course (PDC), and the pedagogical research course (PRC). The PDC is the internship program, in which student teachers worked on their competence development. For this course, student teachers described their learning goals, process and outcomes in a portfolio. The PRC is a competence development research project with emphasis on the teachers' own roles. Student teachers were free to choose their own research activities, such as experimenting with teaching strategies in their classroom or observing and interviewing others, for example their teacher educators, fellow peers, experts, colleagues, etc. The PDC was documented in a portfolio, the PRC could take the form of a thesis, diary, blog or vlog. Both courses covered the entire length of the internship period, allowing us to study student teachers' learning processes and learning outcomes over the complete internship period. Moreover, course documents and student products gave the most elaborate and rich descriptions into learning processes and learning outcomes. Therefore, these course documents and the resulting assignments were suitable for the analysis.

The Questionnaire on Teacher Interaction (QTI), which is the most widely accepted and commonly used instrument in teacher education in the Netherlands for gaining insight into student teachers' classroom management, was distributed by student teachers in two of their internship classes, mapping their pupils' perceptions of their interpersonal teacher behavior at the beginning and end of the internship. The QTI shows one of the core elements of CM, student teachers' interpersonal relationship, by capturing this from their pupils' perception. In numerous studies, this instrument has shown to be reliable and valid, e.g. scale/section scores show Cronbach's Alpha coefficients between .80 and .90 and scales have shown to display a circular pattern (Wubbels et al., 2006). This instrument was used in addition to the self-report instruments mentioned above, to provide a more in-depth overview of CM from the pupils' perspective. After all, the questionnaire measures how pupils perceive teachers' interpersonal behavior. Via this instrument, student teachers' pupils answered 24 questions about the student teachers' interpersonal behavior (Wubbels et al., 2006).

**Table 1**

Total number of teachers per school subject and number of female student teachers.

School subject	Number of student teachers; female student teachers
Biology	3; 2♀
Chemistry	1; 1♀
Dutch language	2; 2♀
Economics	3; 3♀
English language	3; 3♀
French language	1; 1♀
Geography	1; 0♀
German language	3; 3♀
History	2; 1♀
Mathematics	1; 1♀
Physics	1; 0♀
Spanish language	3; 3♀

### 3.4. Analysis

All relevant fragments about student teachers' CM learning process and CM outcomes, found in student teachers' produced documents, were placed in a case matrix, in order to structure the information regarding student teachers' use of theory, role of teacher educators, self-regulated learning CM goals and CM learning outcomes (with participants in the columns and topics in the rows). In the analysis procedure, the researchers searched for what was dominant for student teachers' CM learning and CM outcomes by counting the collected relevant fragments. Based on finding what was most frequently mentioned by the student teachers, the first and second author assigned each student teacher to a category for each of the aforementioned sub-elements of the learning process and learning outcomes.

Fragments were considered to be relevant when student teachers described an experience they had at the workplace, which they implicitly or explicitly related to their learning process or learning outcomes. In explicit fragments they made that connection by themselves, and in implicit fragments we as researchers saw a connection with other fragments they wrote, in which they for instance, used similar terms or words, or described the same kind of experiences, but were unable to see a pattern themselves. Irrelevant fragments were fragments in which student teachers described general learning experiences, activities in their process or learning outcomes, not related to their CM learning. For instance, student teachers sometimes described their school subject or the design or use of didactic materials. These fragments had no direct or clear connection to their CM, so were left out of our analysis.

These relevant fragments were labelled in terms of categories based on the elements as described in the theoretical framework. The five components of CM by [Evertson and Weinstein \(2006\)](#) were used as labels to typify student teachers' CM goals. For the CM learning process, three variables were used: use of theory, role of teacher educators, and self-regulated learning. The role of theory was labelled by the distinction of [Sjolie \(2014\)](#): theory as prescriptive for practice and theory as foundation. For learning from others, the distinction by [Adams et al. \(2022\)](#) was used: expert, role model and mentor. As for SRL, in line with [Endedijk et al. \(2012\)](#), fragments were coded in terms of 'passive/active regulation' and 'prospective/retrospective regulation'(see [Table 1](#)).

The first author conducted this coding process for all 24 cases. The second author conducted this process for 8 cases. Then, the first and second authors discussed their coding (consensus based coding), and found that they had similar codes, only varying in 10% of the cases in which they had comparable words meaning a similar codes. Eventually, for these 8 cases, the third author checked the whole coding process for its traceability and reliability. This step was followed by a discussion between all three authors in which they reflected on the coding process. This did not lead to any further questions or doubt. The analysis led to insight into how much attention was paid by the various student teachers to each of the variables, and their sub-categories (as presented in [Table 2](#)).

The outcomes of student teachers' CM learning were coded in terms of the main components of competence: skills, knowledge and/or attitude, and the interpersonal learning outcome. The codes used for the analysis of competence were determined from student teachers' documents (see *Instruments*). In these documents the student teachers described their learning outcomes in their own words. The codes were determined based on what they reported as their learning outcomes, and therefore emerged from (and were grounded in) the data. This led to the following main codes. Knowledge about: (1) pupils' socio-emotional development, learning processes and group-dynamics, and (2) non-verbal communication and teacher behavior towards pupils' behavior

problems and order problems. Skills: (1) creating a safe and structured classroom climate, pupils' socio-emotional development and learning processes, and (2) non-verbal communication and teacher behavior, consistency and enforcing the rules. Attitudes: (1) self-confidence, and (2) value (non-)verbal communication and teacher behavior. In the results section these codes will be illustrated in more detail.

The interpersonal learning outcome was analyzed using the QTI ([Wubbels et al., 2006](#); see theoretical framework section). As mentioned above, the QTI consist of 24 questions, scaled from 1 (strongly disagree) to 5 (strongly agree). These scores reflect a certain outcome in 8 different sectors or scales (see also [Fig. 1](#): Directing, Supporting, Understanding, Acquiescing, Hesitating, Objecting, Confronting and Imposing). Combined, scores on the sectors form patterns of images, that can be compared to eight profiles found in prior research. In the analysis a division was made between effective teacher profiles (Directive, Authoritative, Tolerant-Authoritative, Tolerant) and less effective teacher profiles (Uncertain-Tolerant, Uncertain-Aggressive, Repressive, Drudging), based on the characteristics of these profile types of the classroom environment as discussed in [Wubbels et al. \(2006\)](#). The researchers calculated the statistical distance from each student teacher (e.g. the aggregated scores of their classes) to each of the eight profiles, and allocated each class to the profile to which the closest distance was found.

The QTI was sent out to two classes per participant. A comparison between measurement moments and both classes has been made in order to determine whether the participant had an effective teacher profile during both moments and classes. Moreover, it was possible that a participant had less effective teacher profiles during both moments and classes, or showed growth, starting with a less effective teacher profile in one or two classes and had an effective teacher profile during the second measurement moment. Obviously, an adverse development was also possible, starting with an effective teacher profile during the first measurement and having a less effective teacher profile during the second measurement. From two participants we did not receive QTI outcomes. Therefore, the QTI was not included in the analyses in those cases. In the first round, 24 student teachers participated with 48 classes with in total 1060 pupils (range in class size was between 15 and 31). In the second round, 22 student teachers participated with 44 classes with in total 986 (range in class size was between 17 and 30).

In order to find similar patterns in student teachers' CM learning processes and to distinguish profiles of student teachers' preferred CM learning, a Multiple Correspondence Analysis (MCA) was conducted. MCA is a data analysis technique used to detect and represent underlying structures in a data set that is categorical in nature. In this approach, associations between variables are uncovered by calculating the chi-square distance between different categories of the variables and between the participants. This results in a matrix, that allows for the direct representation of participants as points in geometric space, which aids the interpretation of the structures in the data ([Greenacre, 2007](#); [Le Roux & Rouanet, 2004](#)). In doing so we obtained insight into which participants had a similar learning process in terms of the categories CM goals, use of theory, role of teacher educators, and self-regulated learning.

This phase was followed by a final step, in which the focus was finding relationships between the (MCA) profiles of student teachers' CM learning and student teachers' CM learning outcomes. In order to do so, cross tabular analysis was conducted, using specifically the chi-squared statistic in order to identify any potential relation between the variables. This technique allowed the researchers to capture potential connections between the distinguished groups of student teachers' CM learning processes and CM

**Table 2**  
Groups of student teachers' CM processes.

Group	A	B	C	D
N	10	7	3	4
CM Goals*	All goals	All goals	All goals, except 'Establishing interpersonal relationships with and among pupils' and 'Encouraging pupils' academic engagement'	All goals, except 'Developing pupils' social skills and self-regulation'
Typification	Knowledge driven	Feedback driven	Inspiration driven	Practice driven
Use of theory	Theory as foundation	Theory as foundation	Theory as foundation	Theory as prescriptive
Role of teacher educators	Expert	Mentor	Role model	Role model
SRL	Active/Prospective	Active/Prospective	Active/Retrospective	Passive/Retrospective

outcomes in terms of knowledge, skills, attitudes and interpersonal learning outcomes. The MCA analysis and the cross tabular analysis was conducted using the SPSS statistical analysis software (version 23). The statistical analysis of the QTI and MCA were done separately by the first and third author. They compared their analysis leading to the same findings. This did not lead to any further questions or doubt.

#### 4. Results

In this section the results will be discussed. First, the frequencies (e.g. the number of student teachers in which the respective code was dominant) of the variables pertaining to CM learning processes and outcomes will be described (see also Tables 2 and 3). Then, the results of finding patterns in student teachers' CM learning processes will be presented. Finally, the relations between student teachers' CM processes and CM learning outcomes will be discussed.

##### 4.1. CM goals

Student teachers' attention for CM as specified in their internship goals were rather diverse and covered the specific components of CM of [Evertson and Weinstein \(2006\)](#). Most attention was drawn to the component 'Intervening when behavior problems occur' (6 student teachers), followed by 'Establishing interpersonal relationships with and among pupils' (5 student teachers) and 'Encouraging pupils' academic engagement' (5 student teachers). Slightly less attention related to the components 'Optimizing pupils' access to learning' (4 student teachers) and 'Developing pupils' social skills and self-regulation' (4 student teachers).

##### 4.2. CM learning process

Concerning student teachers' CM learning processes, 16 student teachers used theory as foundation, 8 student teachers used theory as prescriptive. As for their dominant preference of the role of teacher educators, 10 student teachers used them as expert, 8 student teachers saw them as a role model and 6 student teachers used them as a mentor.

Student teachers' SRL consisted of the components active and passive, and prospective and retrospective. As for the component of (re)active, 19 student teachers were characterized as active, 5 student teachers as passive. The other component, prospective and retrospective, was balanced: 13 student teachers were prospective in the planning of their learning, 11 student teachers' SRL processes were characterized as retrospective.

##### 4.3. CM learning outcomes

As for knowledge, 12 student teachers were focused on pupils' socio-emotional development, learning processes and group-dynamics. The attention of the other 12 student students was drawn to non-verbal communication and teacher behavior towards pupils' behavior problems. With regards to the first aspect student teachers used various terms, such as processes of group-dynamics and pupils' social-emotional learning. The second aspect was more drawn to knowledge about teacher behavior characteristics, such as interpersonal teacher behavior and pupils' behavior and motivation.

For skills, 11 student teachers were focused on creating a safe and structured classroom climate, pupils' socio-emotional development and learning processes. The attention of the other 13 student students was drawn to non-verbal communication and teacher behavior, consistency and enforcing the rules. In the first aspect, skills were mentioned such as signaling (individual) needs and dealing with pupils' emotions, which could be described as pedagogical teacher skills. The second aspect was more drawn to teacher skills, with a focus on classroom management, with terms such as instruction, offering structure and maintaining order. Almost equal attention was paid to both themes.

With regards to attitudes, 7 student teachers seemed to develop self-confidence, and 17 student teachers focused on the value of (non-)verbal communication and teacher behavior. The first theme was related to the student teacher as a person. Student teachers explicitly described this in terms of struggling with and overcoming their self-doubt. The second theme mainly referred to the development of the value of one's own professional behavior, in which student teachers used terms such as understanding how pupils see them and the impact they have as teachers in the relation with their pupils.

As for interpersonal competence measured with the QTI, the majority of the student teachers (14 in total) displayed stable effective interpersonal profiles, e.g. they had effective profiles in both their classes at both measurements. Three student teachers displayed growth from less effective to more effective interpersonal profiles, while five student teachers remained in the less effective interpersonal profiles. From two student teachers only one measurement was available so growth or stability could not be determined.

##### 4.4. Patterns in student teachers' CM learning processes

The Multiple Correspondence Analysis showed how the variables of the student teachers' CM learning processes (student teachers' use of theory, the role of teacher educators and their SRL) were connected. This resulted in a grouping of student teachers

**Table 3**  
CM learning process vs. Learning outcome knowledge, skills, attitude and QTI.

Knowledge					
Pupils' socio-emotional development	Non-verbal communication and teacher behavior	Total			
Knowledge driven	6	4	10		
Feedback driven	2	5	7		
Inspiration driven	1	2	3		
Practice driven	3	1	4		
Total	12	12	24		
Skills					
Creating an safe and structured classroom climate	Non-verbal communication and teacher behavior	Total			
Knowledge driven	6	4	10		
Feedback driven	3	4	7		
Inspiration driven	1	2	3		
Practice driven	1	3	4		
Total	11	13	24		
Attitude					
Self-confidence communication and teacher behavior	Value of (non-)verbal	Total			
Knowledge driven	3	7	10		
Feedback driven	0	7	7		
Inspiration driven	1	2	3		
Practice driven	3	1	4		
Total	7	17	24		
QTI					
No comparison teacher profiles profile	Less effective teacher	Growth to profiles	Effective teacher	Total	
Knowledge driven	2	1	0	7	10
Feedback driven	0	3	2	2	7
Inspiration driven	0	0	1	2	3
Practice driven	0	1	0	3	4
Total	2	5	3	14	24

who had similar CM learning processes. The analysis suggested three or four groups, in which student teachers shared certain similar CM learning characteristics (see Fig. 3). In a more specific content analysis, in order to verify the MCA, the researchers came to four distinctive groups (see Table 2), as the differentiating factor of dimension 1 was 'student teachers' SRL', and of dimension 2 'Teacher educators roles'. The close similarities and specific differences concerning in particular Group B and C will be elaborated below. The groups were not distinctive in terms of student teachers' CM goals. Below the table, the groups will be elaborated in more detail.

Group A is the largest group. These were the student teachers who used theory as foundation and were active and prospective in their SRL. These student teachers were very active in terms of overviewing their own learning, finding sources and undertaking learning activities. They were efficient in the organization of their planning and communication with others. They were also self-reflective in a sense that they were aware of what they needed in terms of support from others in the development of their CM learning. Participant 23 described it as follows: *'Thanks to the steps I took during my learning process, supported by the research courses, talking to a lot of people in the school and observing experts' lessons, I became more aware of my role as a teacher for my pupils, and the impact of my passion and enthusiasm in relation to pupils' motivation.'*

Furthermore, these student teachers, but also the student teachers in group B and C, used theory as foundation. Participant 4 described that as follows: *'My major concern in my practice was working on my CM in a sense that I had behavior problem issues. I was really struggling with pupils' behavior. Therefore, I needed theoretical*

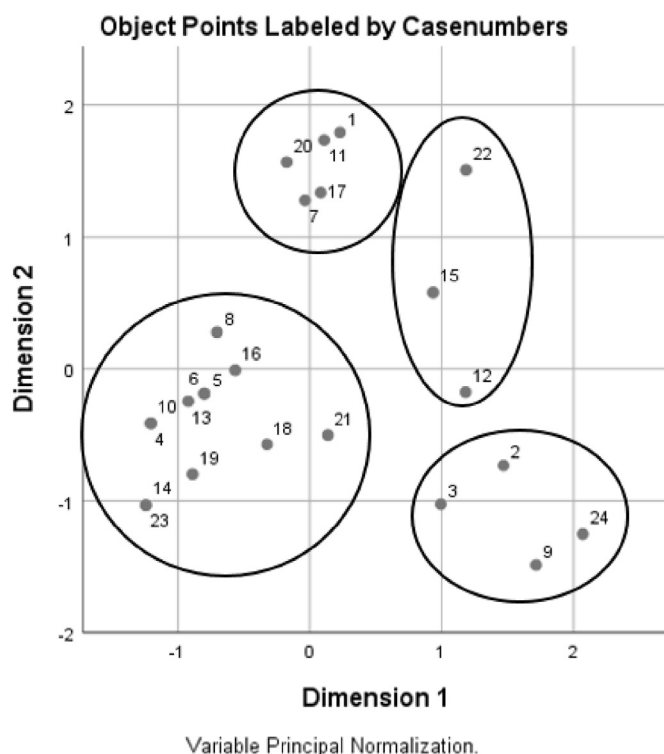


Fig. 3. Output of the multiple correspondence analysis.

knowledge that taught me to understand certain behavior, pupils' social-emotional phases and group-dynamics. That specific knowledge taught me to adjust my own teacher behavior, which had a positive impact as difficulties maintaining order seemed to decrease."

Based on this we would typify group A's learning process as 'Knowledge driven'.

The second largest group of student teachers is group B. They were the student teachers who used theory as foundation and in terms of SRL, were active and prospective in their learning. So far they had similar characteristics to the student teachers in group A. However, these student teachers needed a mentor throughout the whole CM learning process to help them to develop and gain experiences and insights. Participant 17 formulated this as follows: "Each Friday, my teacher educator and I talked about my experiences throughout the week. Sometimes I tend to downgrade these experiences, but the insights and motivational talks from my teacher educator helped me to see these experiences in a meaningful perspective of my learning."

Furthermore, they were able to plan their own learning. They knew what kind of support they needed and what type of activities would help them. However, potentially due to the practical challenges they faced, they needed mentoring from others to help them in accomplishing their goals. Participant 11: 'I knew that I am technically a good teacher and that I can trust my CM skills. However, I sometimes struggle with that trust, and by doing so, tend to set a higher bar for myself. My teacher educator always tells me to keep an eye on the priorities I have in my learning. And trusting on some aspects and working on others, is one of the key priorities.'

Based on this we would typify the process of group B as 'Feedback driven'.

The student teachers in group C showed similarities with the student teachers in previous groups: they were active student teachers who used theory as foundation. In contrast to group A and B, the CM goals of this group were drawn to all goals, except 'Establishing interpersonal relationships with and among pupils' and 'Encouraging pupils' academic engagement'.

They all described their CM learning process as a struggle in who they wanted to be as a teacher. They also had troubles planning and overseeing their CM learning process, hence the retrospective characterization of their SRL. In their struggle, they all described the need for role models who could give them examples of teacher behavior. This role model would also give them also inspiration which was useful for them to develop their own style. Participant 21 formulated this as follows: 'My teacher educator is a great teacher, as he is able to enforce pupils' self-confidence and helps them to be the best version of themselves. I was so inspired, because that was exactly why I wanted to be a teacher. Right now, I feel that I have grown in that kind of behavior, but it sure takes a lot more years to be the same kind of a teacher'.

Based on this we would typify the process of Group C as 'Inspiration driven'.

The goals of the student teachers in group D were related to all goals, except 'Developing pupils' social skills and self-regulation'. Furthermore, they were relatively reactive in their professional CM teacher behavior, as they mainly waited until teacher educators, peers or others would give them advise, ideas for activities etc.

They were also weaker with regards to planning, they did not always oversee the shorter and longer term of their learning process. Furthermore, they tended to lean on the sources and activities indicated by others, such as fellow peer student teachers and their teacher educators. Moreover, they used theory as prescriptive. Participant 24 described that as follows: "My teacher educator told me that were five suggestions how to handle disturbing pupils' behavior, as described in teacher educational literature. My teacher educator thought it might be helpful for me, and I agreed I needed such

suggestion. So I tried these suggestions out and found out some actually worked for me."

Working on their CM issues, these persons saw teacher educators as role models to learn from. Furthermore, the main challenge for student teachers in group D was their CM organization. Participant 3: 'My major pitfall is my organizational ability. I really found it hard to find a balance between my personal social life, the internship and teacher education courses. I had so much difficulty managing that process as a whole. This also resulted in CM problems such as bad organization, failing to advise my pupils adequately on time planning and materials. I even forgot to bring the tests to class one day, right at the moment my pupils had an exam. That was a big mistake.' Moreover, similar to the previous quote, the teacher educator of participant 9 added a short observation in the student teachers' learning document: 'X is not committing himself professionally to certain agreements. Materials were often late and incomplete. He also missed some appointments we made. Those missteps reflect the poor organization in his classroom, as there was a structural lack of strict planning and continuity.'

Based on this we would typify Group D's process as 'Practice driven'.

#### 4.5. The relation between student teachers' CM learning process and CM learning outcomes

Cross tabular analysis was used to find a relation between student teachers' CM learning processes, using the four profiles as presented above, and their CM learning outcomes. In this section the findings of this analytical step will be presented, and can also be found in Table 3 (see below).

Concerning CM learning profile and knowledge as a learning outcome, a minor, not statistically significant, relationship was found ( $\chi^2 = 3.019$ ;  $p = 0.374$ ). The 'Knowledge driven' and 'Practice driven' student teachers tended to be slightly more often focused on 'Pupils' socio-emotional development'. The development of 'Feedback driven' and 'Inspiration driven' student teachers was slightly more often drawn to 'Non-verbal communication and teacher behavior'.

As for CM learning profile and skills the 'Knowledge driven' student teachers paid slightly more attention for 'Creating a safe and structured classroom climate', the student teachers in the other groups tended more to 'Non-verbal communication and teacher behavior'. According to Chi-squared test, no statistically significant relationship existed ( $\chi^2 = 1.721$ ;  $p = 0.622$ ).

The relation between CM learning profile and QTI outcomes was also not statistically significant ( $\chi^2 = 6.208$ ;  $p = 0.298$ ). Most student teachers of every group had an effective learning profile. However, interestingly, as five student teachers in total had a less effective teacher profile, it was notable that most of them belonged to the group 'Feedback driven'.

A statistically significant relationship was found between CM learning profile and attitude as a learning outcome. Most student teachers developed their attitude in terms of 'Value of (non-) verbal communication and teacher behavior'. This was specifically the case for 'Knowledge driven', 'Feedback driven' and 'Inspiration driven' student teachers. Most 'Practice driven' student teachers tended to the development of 'Self-confidence' as their main attitudinal outcome. Chi-squared test showed a significance in this cross tabular analysis ( $\chi^2 = 6.978$ ;  $p = 0.038$ ).

## 5. Discussion

The aim of this research was to investigate patterns in student teachers' CM learning processes, student teachers' CM learning outcomes and the relation between these two elements. A main



outcome of this study shows four patterns of student teachers' CM learning processes were found. Moreover, student teachers showed a wide variety in CM goals. Similar CM outcomes in terms of knowledge and skills were found for each of these four profiles. The only statistically significant relation was found between CM learning profile and attitude as a learning outcome. Furthermore, student teachers developed their attitude in terms of 'value of (non-) verbal communication and teacher behavior'.

### 5.1. Theoretical implications

In the first step of this research we analyzed what goals were noticeable in student teachers' CM competence development. We found a wide variety in student teachers' focus on CM goals. The focus of the student teachers was on all components as described by [Evertson and Weinstein \(2006\)](#) and not just interpersonal relationships. They also focused on optimizing pupils' access to learning, encouraging pupils' academic engagement, developing pupils' social skills and self-regulation, and intervening when behavior problems occur. Student teachers' attention to these various components was similarly divided over the various components. This finding is in line with other researchers who have studied CM ([Martin et al., 2016](#); [Emmer & Sabornie, 2015](#)). In our own previous study ([Adams et al., 2022](#)), student teacher attention was merely drawn to establishing healthy relationships between teachers and students. Interestingly, the finding of the present study that student teachers' attention is drawn to all components of CM resembles the finding of another earlier study ([Adams et al., 2020](#)) that, according to teacher educators' views of the ideal or preferred curriculum, student teachers' attention ideally and preferably is divided over the five components.

In the following step we specifically studied what student teachers' CM learning processes looked like. As for the student teachers' CM learning processes, four different profiles were found: 'Knowledge driven', 'Feedback driven', 'Inspiration driven' and 'Practice driven'. These profiles differed in their approach concerning student teachers' use of theory, the role of teacher educators and their SRL. In relation to other studies about student teachers' learning patterns, these profiles showed some differences and similarities. In comparison with [Endedijk et al. \(2012\)](#), we found an overlap between all combinations of the components 'Active and Passive' versus 'Prospective and Retrospective', except the combination 'Passive and Prospective'. This finding is in line with our previous study (2022). In line with [Endedijk et al. \(2012\)](#) we found that most student teachers had an 'active' and 'prospective' profile, which might indicate a confirmation of a desired tendency in teacher education. [Oosterheert and Vermunt \(2001\)](#) made a distinction between five orientations of student teachers' learning: survival, closed reproduction, open reproduction, closed meaning and open meaning. In their study, they focused on mental models of learning, student teachers' ideals, cognitive activities, regulation and concerns. These variables captured more generally how student teachers learn during their internship. However, their orientations show resemblances with the profiles in our study. For example, their research also indicated, and this confirms our finding, that student teachers with more ideal orientations (like 'Open Meaning') created more self-regulated knowledge, had deeper cognitive approaches and evaluations and searched for more external suggestions. Their findings also are in line with our finding that student teachers with less ideal orientations (like 'Survival') were more dependent on external solutions and were less likely to search actively for external suggestions. Thus, it seems that some of the processes and patterns found in our study in the context of CM bear some resemblance with how student teachers

learn this during their internship.

As for CM outcomes of student teachers' learning, one aspect was rather dominant and concerns student teachers' development of attitude. This could be explained by the fact that the attention given to this aspect is rather abstract in curriculum courses, student teachers were inadequately prepared and if educated enough, and it might become more real and urgent during the internship. This confrontation with student teachers' attitude is the reality check of practical experiences, described in other research as professional identity tensions ([Pillen, 2013](#); [Bronkhorst, 2013](#)).

As for the relation between student teachers' CM processes and CM outcomes, one statistically significant relation was found: active (and prospective) student teachers were mostly focused on the value of (non-)verbal communication and teacher behavior, unlike passive (and retrospective) student teachers who were more likely to develop their self-confidence. This is an interesting insight as one would expect most student teachers' attitude development related to classroom management would relate to self-confidence ([Pillen, 2013](#)). More research is needed to further confirm whether this was a unique finding or not.

### 5.2. Implications for teacher education practice

The four types of student teachers' CM profiles that were described in this study could enrich teacher educators teaching CM. It may be helpful when teacher educators recognize these profiles in order to differentiate in their CM coaching and supervision. This also implies that teacher educators need to be capable of keeping the different profiles in mind, and need to have a varied repertoire of CM coaching and supervision as a result, so they can switch and differentiate between various student teachers' with different CM learning profiles. In that light, some particular profiles need specific teacher educators' attention, like 'Inspiration driven' student teachers, who struggle with their planning, or 'Practice driven' student teachers, who may need coaching on their passive attitude.

One of the findings of this study was the major attention to (non-)verbal teacher behavior. What does that mean for the teacher education curriculum, for teacher education institutes, the practice of the schools, and the consistency between them? In any case, more specific attention should be addressed to teacher behavior earlier in teacher education curricula.

Furthermore, as most attention of student teachers' CM competence development is related to their (non-)verbal teacher behavior, QTI could be used more frequently in order to visualize the interpersonal relation of student teachers with their pupils. By using this instrument, teacher educators and student teachers can have more structured conversations about student teachers' CM issues, in order to conceptualize student teachers' CM challenges and typify student teacher' CM learning strategies. Keeping that in mind, it be viable if teacher education institutes offer the QTI more systematically.

### 5.3. Limitations and opportunities for further research

One of the limitations was that this studies' setup was mainly based on self-reported data by the student teachers and did not provide insights into the quality of student teachers' CM (apart from the QTI), and the way these student teachers performed in practice as teachers.

The exclusion of the teacher educator perspective was also a limitation. Despite the fact that the teacher educators validated student teachers' documents, we did not use assessments documents, written by teacher educators or their perceptions. Future research could include more teacher educator data in order to capture a more comprehensive view of student teachers CM

learning process and CM outcomes.

Another limitation was that the QTI data profiles were based on student teachers' pupils' perspective only. We missed the opportunity to also include the perceptions from teacher educators and student teachers themselves, as multiple types of perceptions could be an added value (den Brok, 2013). So, in terms of future research, it would be helpful to not only collect QTI data from student teachers' pupils, but also their supervisor, and the student teachers themselves. In doing so, one would obtain a much richer perspective on student teachers' CM learning.

The output of the MCA was another limitation, as the MCA showed a picture of three or four groups of student teachers' CM learning. Considering the implications of potential differences, we chose to present four groups. However, as the numbers of student teachers in this study were low, it remains a question for future research whether the same result would arise in larger samples.

Moreover, future research could include and evaluate an early intervention focused on the use of theory and the role of teacher educators in the internship (see also implications).

## 6. Conclusion

The results of this study showed an attention by student teachers for a variety of CM goals, and four different groups were found based on patterns in student teachers' CM learning, e.g. their use of theory, their need of teacher educator roles and their SRL. However, the question remains how student teachers' patterns in CM learning processes relate to their CM learning outcomes. We did find some trends, but only one statistically significant relation was found between CM learning profile and attitude as a learning outcome. Moreover, student teachers developed their attitude in terms of 'value of (non-) verbal communication and teacher behavior'.

## Credit author statement

Tom Adams: Conceptualization, Methodology, Formal analysis, Investigation, Writing - Original Draft, Bob Koster: Validation, Formal analysis, Writing - Review & Editing, Supervision, Perry den Brok: Methodology, Validation, Formal analysis, Writing - Review & Editing, Supervision.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

All authors declare that they have no conflicts of interest.

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